TRANSITIONING MOWER FLEETS TO PROPANE

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exmark.com

EXECUTIVE SUMMARY

- 2013 market research conducted by Lawn & Landscape magazine revealed that sixty-three percent of homeowners responsible for decisions related to some or all landscape contract services are influenced by a sense of environmental responsibility.
- Propane-fueled commercial mowers and equipment produce significantly fewer greenhouse gasses (GHG) than those fueled by gasoline.
- According to Landscape Management magazine, in 2012 approximately four percent of the professional landscape market had invested in alternative fuel mowers or vehicles. Eight percent of survey respondents reported planning to purchase alternative fuel mowers during 2013.
- In 2010, PERC, Kohler and Exmark partnered on development of the industry's first EFI-propane engine for commercial mower applications. In 2013, Exmark introduced a Kohler EFI-propane powered version of its Lazer Z S-Series zero-turn riding mower and two EFI-propane Turf Tracer wide area walk behind models.
- The Kohler Command Pro EFI-propane engine is the industry's first OEM-level EFI-propane engine, offering full commercial warranty and support. The new engine increases fuel efficiency by up to 25 percent, and coupled with the lower cost of propane, reduces overall fuel costs by up to 40 percent compared to a carbureted gasoline engine. Uptime is also improved since the engine solves startability and performance issues frequently encountered with aftermarket propane conversions.
- Propane is widely available nationwide and is used in 12.6 million U.S. households for heating, cooking and recreation. It is a fossil fuel derived from the refining of oil and natural gas. It is a very safe fuel for commercial mowers, with an ignition temperature that's nearly double that of gasoline (900°F vs. 495°F) and robust, sealed containers that virtually eliminate the opportunity for fuel spillage.
- The selection of a propane retailer and the negotiation of a seasonal contract are two important aspects of a switch to propane for landscape maintenance professionals to consider.
- Incentives from PERC, as well as a number of state propane marketing associations can mitigate some or all of the increased cost of propane mowers. Combined with the EFI-related fuel savings and the lower cost of propane, Exmark mowers powered by Kohler propane-EFI engines can save up-to $2/hour, or more depending on duty cycle and other factors. This allows pay back of the added investment in just 1-2 seasons.

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Cover and Executive Summary Photo: Exmark Mfg.

1. OBJECTIVE

The objective is to deliver research related to the benefits of using propane as a fuel for equipment used by landscape professionals, including but not limited to, commercial walk-behind and zero-turn mowers, pick-up trucks and other on-site equipment. Such equipment includes generators used to charge the batteries of electric-powered hand-held equipment including trimmers, blowers and saws. An additional objective is to document the experiences of landscape professionals who have invested in propane-fueled equipment, in order to provide real world perspectives to those considering making the switch.

2. BACKGROUND

Clean burning, portability and high energy content have helped propane establish itself as a preferred fuel for engines in a number of agricultural and commercial applications, including forklifts, floor cleaning equipment, irrigation equipment and mid-size trucks. It also is used in more than 12.6 million U.S. households for heating, cooking and recreation. (1,3)

Propane, or Liquid Petroleum (LP) Gas is considered an 'alternative fuel' under the Energy Policy Act of 1992, and it is one of the most common alternative fuels used in the world today (2,3). LP Gas is a fossil fuel derived from the refining of crude oil and production of natural gas. Today, three grades of commercial propane are available: HD5 for internal combustion engines, commercial propane, and a commercial propane/butane blend (11). Propane's easy storage and portability, along with its high energy content and low emissions, make it an excellent option for commercial equipment. (13)

According to 2012 research conducted by Landscape Management magazine, four percent of landscaping companies have invested in alternative fuel mowers or vehicles. (11)

3. PROPANE: PHYSICAL AND CHEMICAL PROPERTIES

Because the boiling point of propane is -44°F, it is in gaseous form in normal ambient conditions. Propane must therefore be pressurized (typically 65-180 psi) to keep it in a liquid state in a closed container, such as the fuel cylinder on a commercial mower. (5)

In its gaseous state, propane is 50 percent heavier than air. Propane in its liquid state is 29 percent less dense than gasoline, but it has a research octane number (RON) of 110, compared to the RON of unleaded gasoline, which is typically about 92 (5,6,7).

3.1 PROPANE ENERGY COMPARISON

Propane has about 6 percent greater energy content (LHV) than gasoline on a per mass basis. (8,29) However, because propane is less dense than gasoline, it takes 1.36 gallons of propane to equal the same energy content as one gallon of gasoline. (6,7) Because a larger volume of liquid propane is required to achieve the same energy content as gasoline, manufacturers may consider specifying larger tanks for propane-fueled mowers to achieve similar run times.

Propane is used in more than 12.6 million U.S. homes for cooking, heating and recreation.

3.2 PROPANE SAFETY

Photo: Exmark Mfg.

Propane is very safe to transport and use, especially compared to gasoline. Its ignition temperature (900°F) is nearly double that of gasoline (495°F), making spontaneous combustion less common. Additionally, since a pressurized fuel system is required to keep propane in its liquid state during use in normal ambient temperatures, the tanks are robust – designed to withstand pressures of 1000 psi – as specified by the ASME Boiler and Pressure Vessel Code (2,3,5). The cylinders are 20 times more resistant to puncture than gasoline or diesel tanks. Since propane is a gas in typical ambient conditions (40°F-100°F), small fuel spills in an outdoor environment will vaporize and dissipate immediately with no ground contamination. However, since propane is more dense/heavier than air, if propane leaks in an enclosed indoor space, it can form a flammable layer at ground-level. (2) In this way, gasoline and propane are similar in vapor form. Direct contact with propane on the skin can also cause burns from freezing.

4. GREEN INDUSTRY PROPANE TRENDS

While just four percent of contractors reported currently using alternative fuel mowers and equipment, eight percent of respondents to the 2012 Landscape Management survey reported they were planning to purchase alternative fuel mowers or vehicles in 2013. (11) This would represent a more-than doubling of market share for alternative fuel equipment in just one year.

The increased availability of propane-fueled mowers and equipment, combined with incentives available from the Propane Education and Research Council (PERC), and state-level incentives or rebates in a number of states (32), can mitigate the typically higher up-front purchase cost of propane-fueled mowers. As of March 2014, this incentive from PERC is $1,000 for a factory-built propane mower, or $500 for a qualifying conversion. Additional state incentives are available in a number of states as well. (29)

In 2010, Kohler partnered with PERC and Exmark to develop and test the industry's first OEM propane engine with Electronic Fuel Injection (EFI). The twin-cylinder engine was developed specifically for use in commercial mowers and other landscape equipment. As the industry's first OEM-level propane-EFI engine, it offers full commercial warranty and support.

Photo: Exmark Mfg.

5. PROPANE MOWERS AND EQUIPMENT

Propane mowers have existed in the marketplace for more than five years; however, the continued escalation in the price of gasoline and new advances in small propane engine technology have combined to increase the value proposition of propane-fueled commercial landscape equipment. Whereas the visionary landscape professionals were converting commercial zero-turn riding mowers to propane 10 years ago, often to be greener, or simply because a contract mandated it, today contractors can turn an investment in propane into increased profitability through reduced fuel expenditures across mower and truck fleets.

Early entries in the propane mower market used converted gasoline engines, which allowed contractors to make the switch to propane and market their business as Green and save a certain amount of money courtesy of the price gap between propane and gasoline.

"If you look at the price of gasoline and propane over the past five years, the gap between the two has gotten a lot bigger, especially since 2011," said Exmark Chief Development Engineer, Garry Busboom. "I don't think this is a short-term anomaly."

Busboom said early converted propane units had relatively frequent performance issues, including challenges with startability and issues with pressure regulators staying in adjustment. And because the systems relied on a conventional carburetor, they had no ability to adjust to environmental variables, including altitude, temperature and more, in real time.

"Looking at the systems out there (in 2008), they were primarily conventional carbureted systems with a regulator," Busboom said. "I could see early on that EFI was very likely going to be the only way to reduce or eliminate a lot of the issues we were seeing with units in the field. Because the converted propane engines at the time weren't being tested to OEM standards for startability, durability and reliability, our customers couldn't be sure how a converted propane engine would perform in their unique environments.

"Our customers told us they wanted the durability, warranty and technical support that only an OEM-engineered propane engine could offer. It was a big deal, so we pursued development aggressively."

Using parts available in the aftermarket, Busboom built and tested a prototype Kawasaki propane-EFI engine in the Exmark R&D Laboratory in 2009.

"Initially, we developed an EFI system for one of our Lazer Z mowers," Busboom said. "I sourced parts and built the wiring harness myself. An OEM supplier had developed a propane fuel injection system for a similar engine, so I simply adapted the system to our mower."

After positive initial testing at Exmark, Busboom informed engineers at a number of engine manufacturers (including Kohler) about the project. He also worked to connect EFI component suppliers to his OEM engine contacts. (27)

PERC Senior Programs Manager, Jeremy Wishart, said Kohler's request for funding to assist the development of a propane-EFI engine was especially timely.

"In our field research, we'd been talking to a lot of larger landscapers, and they were looking for something that wasn't a conversion they did themselves. Large customers like Brickman and Mainscape wanted an OEM-engineered solution – one that included the full support and warranty of a factory-engineered engine." (31)

5.1 NEW ENGINES AND TECHNOLOGY FOR PROPANE

The resulting partnership between PERC, Kohler and Exmark produced just such an engine. A fully OEM-engineered EFI-propane engine, Kohler's new engine still shares the vast majority of its components with the company's renowned Command Pro EFI engine.

Exmark's Busboom says there are four major changes that make the Kohler EFI engine propane-specific.

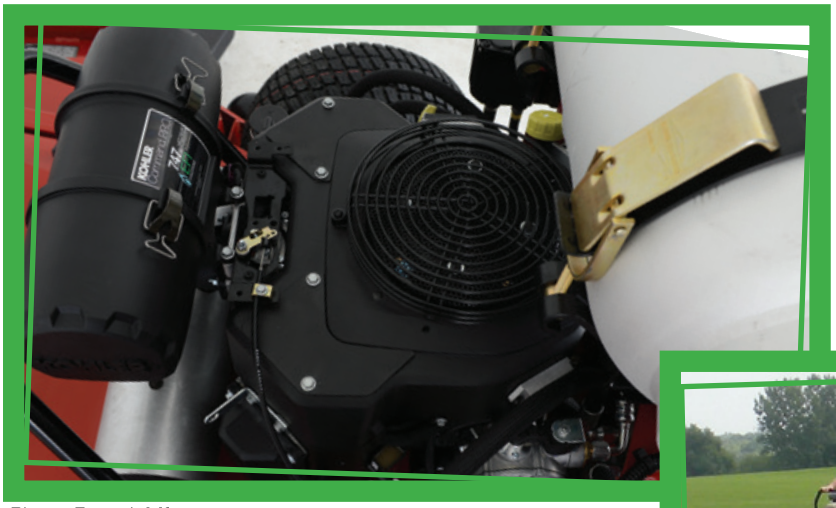


Photo: Exmark Mfg.

"At the OEM level, all Kohler had to do was re-program the Engine Control Unit (ECU), change the fuel injector valves, and change the wiring harness. Aside from those modifications, the engine is basically the same as Kohler's proven Command Pro gasoline-EFI engine." (27)

Eric Hudak, a senior product marketing manager at Kohler, agrees that the similarities between the engines are more than skin-deep. One distinct advantage both engines share is Kohler's closed-loop EFI system, which allows real-time adjustments to the fuel system to optimize performance and efficiency.

"We evolved the closed-loop EFI system developed for our gasoline engines, adapting it to work with propane. Both engines have an ECU that has the ability to detect any issues within the fuel system and make appropriate adjustments. We've optimized the engine performance for propane, so the power and torque are not compromised.

"The base engine is by and large the same engine as our Command Pro EFI gasoline model. Oil changes, air filters and the durability of the engine in commercial use end up being the same. Additionally, the diagnostic tools we've developed for our gasoline-EFI engines can be used in the same manner on our propane-EFI engines." (29)

The 45.6 cu. in (747cc) Kohler Command Pro propane-EFI engine entered production for the 2013 season, first appearing on the Exmark Lazer Z S-Series zero-turn rider. In late-2013, Exmark introduced two EFI-propane Turf Tracer wide-area walk behind models with the new propane-EFI powerplant.

Photo: Matt Gersib

5.2 PERFORMANCE AND EFFICIENCY BENEFITS

Hudak said the company's propane-EFI system significantly increases fuel efficiency in a commercial mower application. While he was careful to say that external factors such as the price of each fuel, varying duty cycles and other factors make it hard to nail down a specific number, there are undoubtedly cost savings on the table for contractors running propane-EFI equipment.

"In real world testing, we're seeing an overall 25- to 30-percent cost benefit running propane, when compared to running gasoline. When you combine the 25-percent fuel use savings (from EFI) with the lower cost of propane, you end up saving quite a bit.

"It can be north of 40-percent in some situations, and that's significant. The payback is most often within one to two seasons of use, and if PERC incentives are factored in, it pays back sooner." (29)

From an engine performance standpoint, Busboom says the Kohler propane-EFI engine is a major step forward in performance and reliability, when compared to converted carbureted engines.

"The startability issues we were finding with converted propane engines simply went away when we went to the Kohler propane-EFI engine." (27)

Converted propane engines have a reputation of lower horsepower output than gasoline-fueled counterparts, but according to Mainscape Military–SE Regional Manager, Dave Barr, the propane-EFI engines are solid performers.

"On my 72-inch Lazer Z, in the worst cutting conditions, there is a little bit of a decrease in power with the EFI-propane engine (relative to gasoline-EFI)," he said. "But that's a worse-case scenario – not typical of our normal work. So, you may get a little less total power, but the mowers are a lot less expensive to run."

Barr said Mainscape is committed to propane-fueled mowers, calling the decision a no-brainer. But with just a portion of the company's fleet running propane, he sees the potential for additional savings to-come.

"We're at 25-percent savings in fuel costs overall today. We'd probably be doing even better if we were all-propane when it comes to our mowers. So there is savings, no doubt about it.

"We are looking to purchase an increasing amount of propane-fueled equipment moving forward, especially as the viable applications for propane increase." (26)

5.3 PROPANE-FUELED COMMERCIAL MOWERS

PERC's Wishart said Exmark's propane-EFI Lazer Z S-Series and Turf Tracer models are representative of the current state of the art when it comes to commercial propane mowers.

"Because it's a total OEM propane package that is also an industry-leading Exmark mower, customers love it. It's been engineered from the start as a propane mower, so the performance and reliability is the same as you'd expect from a gasoline-EFI Exmark mower. It's a 100-percent propane solution." (31)

5.4 INCENTIVES AND REBATES

PERC launched its successful Propane Mower Incentive Program in 2013, and Wishart says the program has enough funding to last at least through the end of 2014.

The Propane Mower Incentive Program helps contractors with a $1,000 incentive for each propane-fueled riding mower, and $500 for each walk-behind mower, or qualifying conversion to a machine with fewer than 250 hours of use (using an EPA- or CARB-approved conversion kit).

"An applicant can receive incentives for up-to 25 propane fueled mowers each year," Wishart said. "Unless we have a huge run-up of several thousand more incentive applications, we'll have funding through at least the end of the year, so a contractor shouldn't fear they'll

buy a mower and not be able to receive the incentive." (31)

In addition to incentives available from PERC, a number of states also have incentive or rebate programs for propane-fueled mowers. Research in March 2014 indicates current programs in Alabama, California, Florida, Illinois, Louisiana, Missouri, Texas and Wisconsin. The state propane marketing associations are good resources for information on availability of state-level incentives and/or rebates. (32)

6. PROPANE FUELING OPTIONS

6.1 SELECTING A PROPANE RETAILER

"Aside from the products you choose, the most important aspect of all the commercial mowing movement is the relationship with the propane retailer," PERC's Wishart said. "The propane retailer needs to understand the unique needs of green industry customers. They exist to help customers make the most of their propane investment, so the relationship between a contractor and a local propane retailer is critical."

According to Jim Flippo, owner of Lasting Impressions Landscape Contractors, Inc., it's important to work with a propane retailer that's interested in working with you.

"We ended up going with Thompson Gas and the guy I work with there is super knowledgeable and enthusiastic." (28)

Doug MacMaster is Flippo's representative at Thompson Gas. He said Flippo is a good example of what a contractor can achieve with propane.

"Jim was already converting mowers as well as trucks, which made the numbers work a lot better," MacMaster said. "The volume was greater from day one, so it made us willing to make an investment in equipment at his location." (30)

Wishart said that when a landscape contractor makes the switch to propane, it's not just reflecting on their company, it also reflects on the propane marketer.

"Because their (the propane marketer's) name is typically printed on the propane cylinders, it's good marketing for them when a contractor is successful with propane." (31)

According to Busboom, it's important for landscape maintenance professionals to negotiate seasonal pricing contracts with suppliers.

"To maximize cost effectiveness, it is essential to negotiate a seasonal contract with your supplier for the price of propane." (27)

6.2 PROPANE FUELING OPTIONS

MacMaster said there are two primary fueling options for green industry clients – cylinder exchange and on-site refilling. Typically, if a contractor is using 5,000 gallons of fuel or more annually, Thompson Gas will invest in placement of an on-site fueling station at the contractor's shop. He said it won't be the same state-of-the-art networked filling station with card readers at the pump. That said, the system would be similar to the pumping station many gas stations use.

"We estimate a typical commercial mower will use about 1,000 gallons of fuel annually, so a contractor with five or more propane mowers, or perhaps a truck and three mowers, would be able to use 5,000 gallons a year.

"For contractors using less than 5,000 gallons per year, a cylinder exchange program would be more preferable. This is where the National Mall (NAMA) is today. We set them up with the cages and mower cylinders, and then we can go in there with one of our stake body trucks and switch the cylinders out. This summer, we'll have the option of swapping out tanks or refilling them on-site." (30)

Photos: PERC

Exmark mowers help NAMA meet its increasingly stringent green standards. NAMA is currently using the cylinder exchange program through Thompson Gas.

Wishart noted the 5,000 gallon minimum for on-site refueling is a number that varies from retailer-to-retailer.

"I know of a number of propane retailers who are willing to place on-site fueling with a commitment of less than 5,000 gallons." (31)

MacMaster said Thompson Gas will also work with contractors on pilot programs, for those wanting do a trial run with propane equipment to see how it works for them.

"We'll do that if we feel the contractor has the potential for growth in propane equipment." (30)

7. ECONOMIC ANALYSIS

According to U.S. Department of Energy statistics, gasoline and propane prices typically parallel one another over time. However, yearly minimum and maximum prices for each fuel happen approximately six months out of phase, likely due to peak demand for gasoline occurring in summer, combined with the increased demand for propane during colder winter months. (3,13,18)

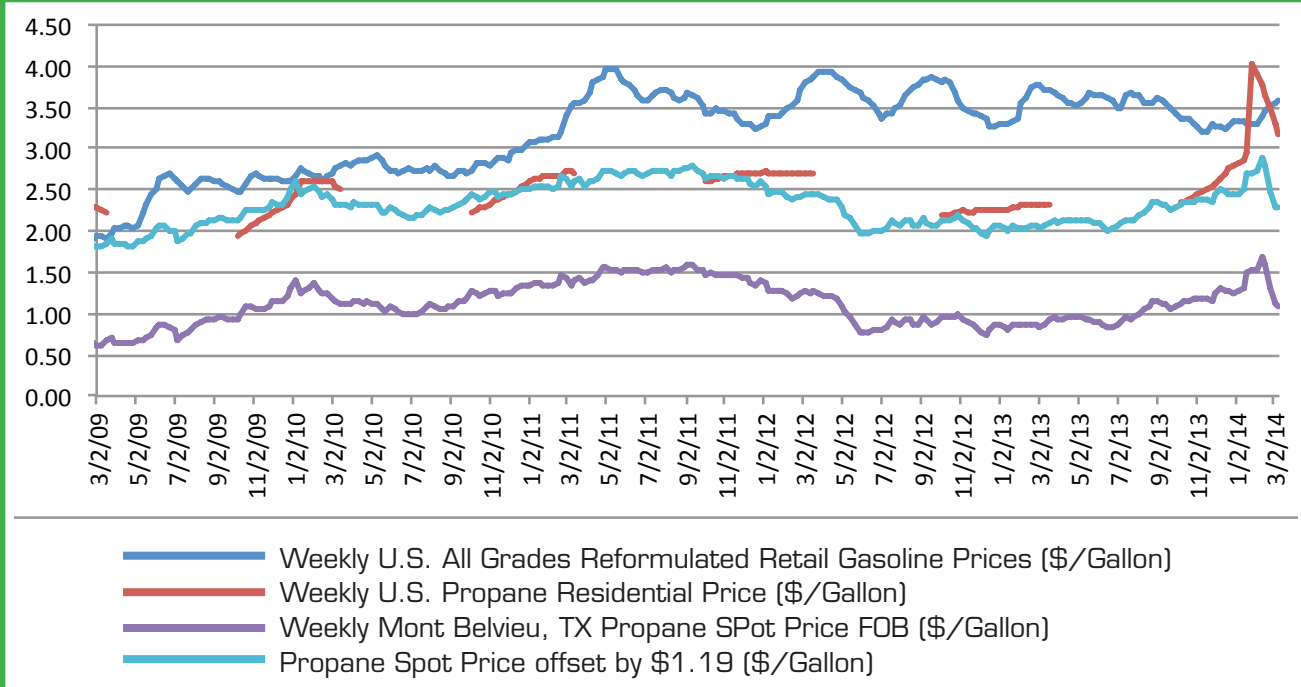
Even with the historic high propane prices experienced during the winter of 2013-2014, by the time of this white paper's writing in March 2014, prices were declining rapidly with much lower prices expected by late-spring. (17, 18)

According to Busboom, a significant source of propane is oil and natural gas production. Recent increases in domestic oil and natural gas production have created propane supply reserves.

"When natural gas and oil production increase, production of propane increases as well," Busboom said. "The U.S. is now a net exporter of propane. Since the demand for propane has not matched recent production increases, I believe this strong supply and demand scenario will keep the propane price differential (relative to gasoline) far into the future." (27)

FIVE YEAR FUEL PRICE TRENDS

U.S. ENERGY INFORMATION ADMINISTRATION DATA



Hudak said recent Kohler research indicates an average 25-30 percent cost benefit for contractors running propane. When combined with the 25-percent fuel savings the EFI system brings to the propane engine, some contractors can ultimately save more than 40-percent on fuel expenditures. (29)

Based on the propane and gasoline prices during the 2013 season, the savings amounted to up-to $2/hour or more per machine, depending on duty cycle and other factors. (annually, per machine) for some operators. (27)

7.1 CASE STUDY – MAINSCAPE, INC.

According to 2012 Landscape Management statistics, Mainscape, Inc. is the 21st largest landscape contractor in the United States. Its place on the "LM150" solidifies the leadership position the company has established. (21)

Mainscape Regional Branch Manager Dave Barr has seen multiple generations of propane equipment pass through his doors. Driven by a desire to continue working with the US Military bases it currently served despite tightening green standards, Mainscape made an investment in propane-fueled zero-turn and wide-area walk-behind mowers in 2011 and 2012.

"Our President, Mark Forsythe, was the one who saw the coming opportunity and said 'hey, we're going to propane whether you guys like it or not'.

"We went to propane in a test situation, first at Fort Knox. The units were running converted Kawasaki engines, and they were burning through the better part of two full tanks of propane each day. We were saving money, but the difference was pretty much all in the difference in fuel cost."

Fast forward to the 2013 season. Barr upgraded to the new generation of Kohler EFI-propane powered Exmark zero-turn mowers and saw his crews' fuel use decrease dramatically, down to a single 10.3 gallon tank of propane per day.

"And while the price fluctuates, propane is priced at about $1.92/gallon today (Dec.

2013). And the busy season for us is the slow part of the year for the propane industry, so while there isn't a lot of movement in prices, there is some."

PERC's Wishart said that Kohler EFI-propane powered equipment can be the tipping point for a lot of landscape contractors.

"From a contractor's perspective, it was a matter of, 'the Green side is great, but it's also got to save me money'. That's the best part about equipment powered by the EFI-propane Kohler engine. With the up-to 40-percent savings they're seeing in the field, they're using less fuel in addition to buying their fuel at a lower price." (31)

8. GREEN CONSIDERATIONS

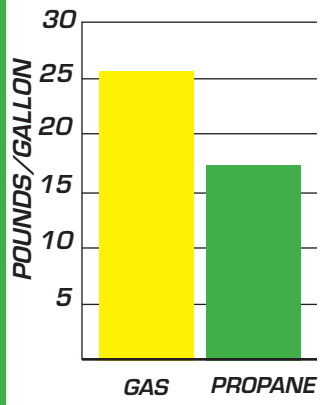
8.1 GREENHOUSE GAS (GHG) REDUCTIONS

In its study, Propane Reduces Greenhouse Gas Emissions: A Comparative Analysis 2009, PERC quantified the greenhouse gas (GHG) emissions of propane- and gasoline-fueled engines. Their testing in the commercial mower category revealed a more than 40-percent percent reduction in GHG emissions with propane. Based on the statistics, propane commercial mowers offer some of the largest potential GHG reductions, compared to their gasoline-fueled counterparts. (15)

Exmark's Busboom said it's important to note the PERC testing may represent more of a best case scenario, rather than real world results.

"I believe the real world GHG reductions to be more in the 25- to 30-percent range, which is still very significant." (27)

CO_2 EMISSIONS



For additional information, go to ***exmark.com*** home page, click on "Eco-Friendly Mowers", then click on "Propane Powered Equipment"

Source: GREET 1 2012 (rev. 1)

Contractors in cities with restrictions on the use of gasoline-powered equipment are able to continue working during "ozone days", as a result of propane's reduced GHG emissions.

A recent alternative fuels report noted:

"Propane has a lot of advantages over gasoline or diesel. One of them is its lower emissions; another is its ability to be used when and where the use of gasoline-powered tools is restricted. Having propane-powered machines allows crews to keep working." (16)

During such 'ozone action days', landscape maintenance professionals running with propane can keep mowing, while those running on gasoline or diesel face mandatory downtime.

Photo: Exmark Mfg.

An increasing number of metro areas have introduced restrictions on gasoline-powered equipment during "Ozone Action Days". This is a competitive advantage for landscape maintenance professionals running propane mowers, as they can keep working during these events.

8.2 GREENER PROPANE TECHNOLOGY

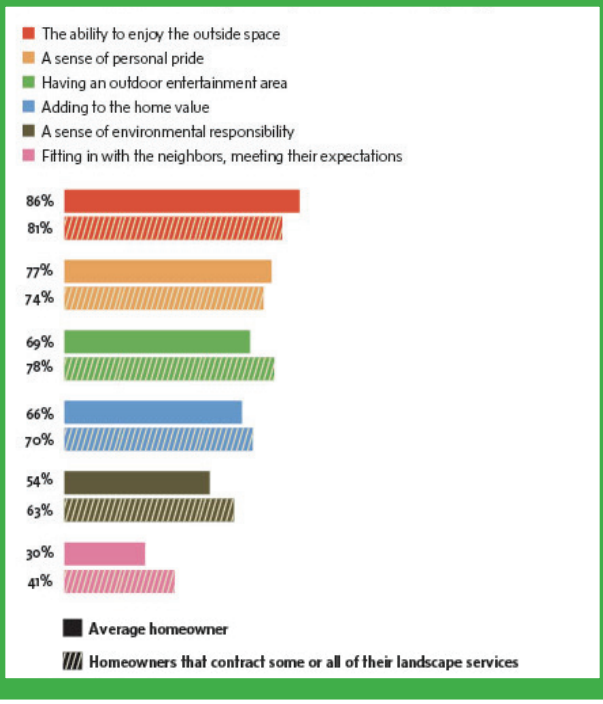
At the time of the EPA's 2009 GHG Emissions study (15), propane-EFI engines did not exist for commercial mowers. Statistics were based on the emissions of converted carbureted engines, but Exmark's Busboom says the move to the superior engine control EFI offers not only reduces fuel use, it generates fewer emissions.

"When you burn less fuel, you're putting fewer emissions into the air. You're being more sustainable, greener, and also saving money." (27)

8.3 SHIFTING CONSUMER AND MARKETPLACE PREFERENCES

2013 market research conducted by Lawn & Landscape revealed that 63 percent of homeowners responsible for decisions related to some or all landscape contract services are influenced by a sense of environmental responsibility. This statistic alone should illustrate the potential for marketing a landscape contractor's investment in propane-fueled mowing equipment. (22)

HOW INFLUENTIAL ARE THE FOLLOWING MOTIVATIONS TO IMPROVE YOUR LANDSCAPING?



A majority of homeowners make landscaping decisions based on a sense of environmental responsibility. (22)

According to Busboom, emissions regulations for municipal, state and federal agencies are becoming increasingly stringent, making a shift to propane-fueled landscape equipment an attractive option.

"A good example of this trend is with the National Park Service," Busboom said. "Their use of Exmark EFI-propane Lazer Z mowers helps them advance the agency's Green Parks Plan." (27)

The Green Parks Plan is a National Park Service initiative to reduce dependence on foreign oil, mitigate the effects of climate change and conserve energy. (REF)

Wishart says there is an innovative Green application of propane that's become increasingly popular with contractors making the switch to battery-powered electric equipment such as blowers, clippers, trimmers and vacuums.

"We talk a lot about propane being a 'one fuel solution'. And what we're talking about here is municipalities and neighborhoods starting to ban certain gasoline equipment, often as a noise reduction method. It's forcing a lot of professional landscapers to explore the new battery-powered options available. But without the capability to charge batteries, they need to carry so many batteries to cover the duty cycle.

"It's a problem we solved by using a portable propane generator mounted to the bed of the trailer. It's used to charge a battery bank with a handful of batteries that can be swapped in-and-out of the chargers as-needed. In fact, PERC tested such a recharging method with Jim Flippo and Lasting Impressions, using a Generac generator." (31)

Flippo said the propane-fueled recharging station is going well, but blowers were the one

thing he hadn't found an acceptable battery-powered option for his needs.

"I'm building my first complete trailer with all of the rechargeable equipment. PERC actually helped us out with the propane generator for that project. We use the generator to charge batteries throughout the day. Our shears and trimmers are working fine. Unfortunately, the backpack blower is our one remaining issue. For now, those won't be converted to electric." (28)

9. THE PROPANE MARKETING OPPORTUNITY

The heightened awareness of Green considerations is underscored by the fact that nearly two thirds of homeowners responsible for contracting some or all of their landscape services base their decisions at least in part on a sense of environmental responsibility. (23) It's a trend that industry leaders are embracing as the new reality, but on the ground the momentum is still building. Contractors making the conversion to propane still have the opportunity to distinguish themselves as an environmentally conscious business.

> "As sustainability becomes more important, going "green" will continue to gather momentum and move into the mainstream. Established traditional landscape companies will need to look at adding eco-friendly services to their menus."

from "New Challenges" in the Irrigation & Green Industry 2013 Status Report of the Green Industry

For contractors interested in pursuing municipal or governmental business, Busboom said a switch to propane-fueled mowers can give contractors a leg-up when competing for contracts.

"As initiatives like the Green Parks Plan become more prevalent with local, state and federal agencies across the country, landscape professionals need to consider how they will be part of the solution if they wish to compete for that business moving forward." (27)

Consumer awareness has never been more focused on the Green movement than it is today. It's a trend that isn't likely to reverse anytime soon, but it also represents a potential point of differentiation for landscape professionals. But contractors must be persistent in marketing their Green initiatives, as the benefits in the marketplace will be mostly lost in the absence of specific marketing.

Photo: Sebert Landscaping

Propane-fueled mowers and equipment are one very visible way a contractor can demonstrate commitment to the environment.

10. OTHER FACTORS

Kohler's Hudak says that with respect to equipment, the cost difference between an OEM-engineered propane-EFI unit and a converted carbureted unit may not seem like much up-front.

"Take a look at the operating costs of each machine two or three years down the road, and you'll realize the difference in cost of ownership

is significant. The majority of that savings is due to the propane-EFI powerplant. A buyer may not even think about the potential for cost savings, but if you had both units running side-by-side, the difference in operating costs would be apparent very quickly." (29)

Barr's experience running both types of mowers supports this with direct evidence.

"Now that we have the EFI Kohler Exmark units, we've gone from needing two tanks a day, to now only needing one tank of propane each day." (26)

10.1 REDUCTION IN FUEL PILFERAGE

PERC's Wishart said one of the green industry's dirty little secrets has traditionally been fuel pilferage.

"When you have numerous fuel tanks on a trailer or job site, it's hard to track exactly where all that fuel is going. But with propane, because you're working with a sealed fuel system, it's virtually impossible to make the fuel escape. And most private vehicles don't run on propane at present, so theft is a bit of a moot point. That fuel is going nowhere." (31)

11. SUMMARY & CONCLUSIONS

The latest generation of propane-fueled equipment with EFI technology delivers efficiency that can significantly reduce operating costs for landscape professionals. Commercial mower engines fueled by propane also reduce GHG emissions by nearly half when compared to gasoline-fueled models. (15) For contractors looking to establish a marketing advantage in going 'green', an investment in propane mowers, trucks and equipment can be a high-profile symbol of that commitment.

Incentives available from PERC and a number of individual states can help landscape contractors minimize the additional cost of propane-fueled equipment. (1, 32) This allows them to recoup the cost of their investment quicker and ultimately, make more money.

The marriage of the clean burning benefits and economics of propane with Kohler's closed-loop EFI system has produced the most fuel-efficient, cost-effective and environmentally friendly engine option available today. (25)

Kohler's EFI-propane Command Pro engine significantly increases the value proposition of propane-fueled equipment. It delivers the durability and performance landscape contractors demand, combined with an up to 25 percent reduction in fuel consumption. When combined with propane's historic price advantage compared to gasoline, the increased efficiency can help contractors save up to 40 percent on fuel expenditures.

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