



NATIONAL PARKS REDUCE PARK EMISSIONS WITH PROPANE MAINTENANCE EQUIPMENT

YELLOWSTONE OLDEST PARK MEETS NEWEST TECHNOLOGY

Established in 1872, Yellowstone National Park is the oldest national park in the United States. Its 300 active geysers, 40 major waterfalls, 97 trailheads and 287 backcountry campsites set the scene for the more than 3 million visitors who visit the park each year. It's not hard to see why Yellowstone is the standard bearer for the national parks system when it comes to preserving the natural environment.

Yellowstone has used propane since spring of 2014 in a variety of applications. The propane Generac 6kW EcoGen standby generator is used to supply power to the Yellowstone Association West Thumb Bookstore located on the park grounds and the propane Generac portable generators are used in the park's electrical shop and its several craft shops. Recently installed, a propane cylinder refill unit located near the public campgrounds allows the public using propane fuel cylinders to recycle

the cylinders for repeated use rather than place them in a compost area.

Most notably, the Mammoth Hot Springs historic district at Fort Yellowstone is operating a propane Exmark Lazer Z S-series propane zero-turn mower. It has run for 120 hours since August 2014.

"The mower has reduced our maintenance time compared with other mowers on the property, because we haven't had any issues with the mower or fuel source," said Molly Nelson civil engineer at Yellowstone. "Most importantly, though, our park goals are to reduce greenhouse gas emissions and the propane equipment is certainly helping us do that."

National parks officials have long preached the importance of sustainable and environmentally friendly practices to the millions of Americans who visit the parks system annually. Now parks officials are

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Molly Nelson
Civil Engineer, Yellowstone

heeding their own advice with the help of propane-powered equipment — from mowers to portable generators to pickup trucks — to tread a little lighter on the grounds that they preserve for the public. Propane has returned the favor by giving the parks system an emission-reducing fuel source that offers enough power to get the job done — oftentimes at a lower operating cost than a more traditional fuel source.

PROPANE CASE STUDY

A trio of federal parks located across the country in addition to the National Mall and Memorial Parks in Washington, D.C., are reducing emissions — and the size of their fuel budgets in some instances — from operating grounds maintenance equipment powered by propane.

As part of a partnership forged with the Propane Education & Research Council, several types of grounds maintenance and power generation equipment powered by propane, rather than traditional fuel sources, were donated to the federal parks operations. In return, the national parks were asked to report and record equipment data.

The program included the National Mall and Memorial Parks, Yellowstone National Park, Blue Ridge Parkway, and Mammoth Cave National Park. In all, PERC donated nearly \$300,000 of equipment to the parks.

NATIONAL MALL AND MEMORIAL PARKS MONUMENTAL JOB FOR GREEN FUEL

The maintenance staff that manages the green spaces of the National Mall and Memorial Parks system has its work cut out for it. In addition to maintaining all of the green spaces at the National Mall and all of the major monuments and memorials, the crews are often faced with operational restrictions, like ozone action days that take effect when weather conditions form with pollution emissions to create high levels of harmful ozone at the ground level. Many municipalities, counties, and other government entities in which public oversight is involved, are held to a higher standard compared with the private sector. And that can often mean parking maintenance equipment on ozone action days as is the case with the National Mall.

The National Mall and Memorial Parks staff found a solution in propane maintenance equipment. Propane mowers are allowed to operate when local regulations ban the operation of gasoline mowers to protect air quality, so maintenance work doesn't have to cease on local ozone action days.

"It is mandatory we have green equipment to operate," says Martha Ellis, general supervisor for the National Mall. "Diesel and electric is what we used to turn to, but

COMPANY

National Mall and Memorial Parks, Blue Ridge Parkway, Yellowstone National Park, and Mammoth Cave National Park

CHALLENGE & SOLUTION

A trio of federal parks and the National Mall and Memorial Parks in Washington, D.C., preach sustainability to the millions of visitors who visit the parks each year. Parks officials turned to propane to put their public message into practice, which helped to reduce emissions and hold themselves to the highest standard when it comes to caring for the environment.

RESULT

- Reduced carbon monoxide emissions and greenhouse gas emissions by more than 40 and 15 percent, respectively, compared with gasoline-fueled mowers.
- The National Mall and Memorial Parks saved \$1,581 in fuel costs over six months operating six propane mowers.
- Blue Ridge Parkway has improved its fuel consumption by 20 percent with propane mowers compared with gasoline.
- Mammoth Cave saved 37 percent per gallon with propane fuel versus its costs with gasoline.

ABOUT THE PROPANE EDUCATION & RESEARCH COUNCIL

The Propane Education & Research Council is a check-off program established, operated, and funded by the propane industry. The only energy council of its kind, PERC leads safety and training efforts among propane retailers and consumers and drives technology development to expand adoption of propane as a clean, domestic, and affordable energy source. PERC programs benefit a variety of industries including fleet vehicle management, landscaping, residential and commercial building, agriculture, and material handling.

The Propane Education & Research Council was authorized by the U.S. Congress with the passage of Public Law 104-284, the Propane Education and Research Act (PERA), signed into law on October 11, 1996. The mission of the Propane Education & Research Council is to promote the safe, efficient use of odorized propane gas as a preferred energy source.

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"We have a win-win situation going on here."

Martha Ellis
General Supervisor, National Mall



with propane, it is dramatically reducing the effects on the local environment while we're out doing our work."

Propane mowers can reduce greenhouse gas emissions by more than 15 percent compared with gasoline-fueled mowers. Additionally, propane mowers reduce carbon monoxide emissions by more than 40 percent compared with gasoline-fueled mowers and meet or exceed all current emissions requirements established by the Environmental Protection Agency.

In the summer of 2013, the National Mall and Memorial Parks received four 72-inch and two 60-inch Exmark Lazer Z S-Series propane zero-turn mowers from PERC. The mowers were the first propane mowers the National Mall had ever operated.

"We have a win-win situation going on here," Ellis says. "We have a big plus with

propane here because of its sustainability characteristics and that it does less harm to the environment, which is a very attractive benefit for us."

The mowers have also provided a financial benefit, too, according to Ellis. She says in the first six months of operating the six propane zero-turn mowers, the National Mall spent 19 percent less on propane compared to what her cost would have been to maintain the same green spaces with gasoline.

Adding to the cost savings is the lack of downtime the mowers have avoided for Ellis and her staff. Propane is clean, which can help reduce engine downtime and keep mowers cutting so the job gets done sooner.

"We have had no maintenance issues related to the propane fuel," Ellis says. "We haven't had a lot of downtime. The mowers have been very beneficial to our operation costs."

BLUE RIDGE PARKWAY PRIDE IN PROPANE

Blue Ridge Parkway is the country's longest linear park. It runs 469 miles through Virginia and North Carolina and connects Shenandoah National Park with the Great Smoky Mountains National Park.

Since receiving three propane Ventrac 4500Z compact tractor mowers in April 2014, a 50-mile section of the parkway has been carrying out trim mowing at developed areas and intersections. Historic display areas, picnic areas, campgrounds, visitor areas, exhibit areas, and vista areas are also maintained with the propane tractor mower.

Since its implementation, the mower has offered up to 20 percent improved fuel consumption compared with gasoline, according to James Fraser, maintenance mechanic supervisor for the parkway. More importantly to Fraser, however, is that the maintenance staff is taking pride in using the cleaner fuel.

"We leave it up to our employees to choose which piece of equipment they use for the day's job and the propane mower is always chosen first; it never sits back at the equipment facility," Fraser says. "The propane mower is much more durable and has suffered no maintenance issues. The employees are proud to be keeping the parkway maintained with a more sustainable mower."

The parkway is taking advantage of propane's ability to act as a single fuel solution for various technologies. Aside from the pair of propane Generac portable generators, parkway officials are considering expanding the use of

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Debbie Northrop
Fleet and Housing Manager, Blue Ridge Parkway

propane to heat more of their buildings and fuel more of their pickup truck fleet (four pickup trucks already run on propane autogas).

"We are very pleased with the propane systems we have — vehicles, mowers, generators, and heating systems," says Debbie Northrop, fleet and housing manager for Blue Ridge Parkway. "The cost per gallon of propane is significantly lower than heating oil and is typically lower than gasoline. This is extremely important as our funds are very limited and as a result we keep the equipment for many years rather than replacing it after just a few years."

MAMMOTH CAVE NATIONAL PARK ONE FUEL SOLUTION

Mammoth Cave National Park, located in Kentucky, received three John Deere ZTrak Z900 R Series zero-turn propane mowers as part of the partnership with PERC. The park experienced a significant decrease in its fuel expenditure because officials were able to lock in a lower rate with their propane provider than with their previous gasoline and diesel providers.

Many operators of propane mowers work with their local propane provider to negotiate a fuel contract. A contract allows operators to lock in a set price per gallon, ensuring they'll pay a consistent price for the cutting season. The arrangement provides insulation from fluctuations in fuel price, and the fuel savings can lead to a quicker return on investment.



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Bobby Sanders
Heavy Equipment Mechanic,
Mammoth Cave National Park

For example, Mammoth Cave has been paying on average 37 percent less per gallon for propane compared with the local cost of gasoline. Since receiving the mowers in June of 2014, they have collectively logged more than 300 hours, so the savings are adding up.

"We're considered a green park and anything we can do to help the environment, we do," says Bobby Sanders, heavy equipment mechanic at Mammoth Cave.

Mammoth Cave also implemented an on-site refueling station for its propane equipment, which includes eight propane-autogas-powered school buses and two propane-autogas-powered pickup trucks. With on-site refueling infrastructure, the local propane provider keeps the bulk tank filled and educates the equipment operators on how to refill the propane tanks when needed.

"When you have your own dispenser, it is a huge advantage cost-wise," Sanders says. "The propane provider is local, so when we get low on propane they get here really quick. They help us fill up the bulk tank and are very good about training our staff to refill the cylinders themselves, so we save so much time refueling with propane compared to gasoline, and that saves money."

