



A lush garden scene featuring a gravel path that curves through the landscape. On the left, a wooden bench is positioned on the path. To the right, there are several large, vibrant green trees and shrubs, including a prominent Japanese maple with bright yellow-green leaves. The background is filled with more greenery, including a white-barked tree on the far left. The overall atmosphere is serene and well-maintained.

Green Alternatives

TO LANDSCAPING AND TURF MANAGEMENT

by Joseph Conrad

Today, facility and maintenance managers have options for powerful, electric, lithium-powered mowers that offer zero emission, zero gas or fluids, and low noise.



The mowers and electric hand-held equipment include a wide variety of options from Push, Walk Behind, Stand On and Zero Turn models. There are commercial cordless electric versions of trimmers, chain saws, pruners, and edging attachments, as well as battery backpack blowers. Universities can maintain their pristine campus landscaping with low noise and a cleaner alternative, even gaining LEED points in many cases.

Electric Alternative to Fossil Fuels

The electric advantage over fossil fuels for outdoor power equipment is substantial. The first advantage is less noise. Electric mowers can offer extreme power, with horsepower that exceeds many commercial gas mowers in their classes, combined with stealthy operation. Most gas mowers are 95-100 db, whereas electric ones are less than 80 db. For every 6db difference in sound, the noise doubles, so the reduction is striking.

Secondly, electric mowers and outdoor maintenance tools offer zero emissions, which benefits the environment and saves money. Outdoor (off-road) power equipment such as lawn mowers, leaf blowers, grass trimmers, farm tractors, ATVs, UTVs, and so on, are all part of a sparsely regulated group of fossil-fuel-powered products. These products have a significant impact on our environment. Since they are not “on-road” vehicles, the EPA has put little effort into regulating emissions on these products.

Due to this limited regulation, outdoor power vehicles have become the worst polluters and the least efficient products on the market today. Emissions are more than 30 times worse than on-road gas vehicles and efficiency is way down near 20%. Gas-powered outdoor power equipment



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A Strategic Update in Brick

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Marion and Clark residence halls—sited to create an unmistakable first impression—are key to TCU’s transformation into a fully residential campus. Their Acme modular brick is a TCU mainstay for well over a century. Dependable Acme Brick hugs the curve on maintenance, design, and life-cycle value. In the race for college students, let Acme arm you with materials for efficient, timely, enduring human spaces.

“We used brick creatively to meet budget, with single-color stacked-bond details, and patterning on one long wall of the dining hall to provide visual relief. We are happy with the results on this first gateway building for Worth Hills, with additional housing planned.”

*– Lindsay Reeds, LEED AP, Associate,
KSQ Architects*

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is so polluting that the EPA has concluded that just one 2-cycle string trimmer can produce as many emissions in one hour as one full size pick-up truck traveling over 3,000 miles.

Thirdly, electric mowers use zero gas. Electric replacements for gas engine products can run at close to 90% efficiency and only cost about 5% of what you would pay to operate and maintain their gas engine rival. This means you can save anywhere from \$5.50 - \$8.00 per hour while mowing with an efficient zero-turn, battery-powered mower.

Finally, low maintenance is another benefit. Routine maintenance is one of the most important, time consuming, and most expensive tasks that every gas mower owner is plagued with time and time again throughout the service life of the mower. With electric alternatives, there is little routine maintenance. There is no internal combustion engine, so no spark plugs to clean or change, no carb/injectors to rebuild, no engine oil or filters to change, no hydraulics, no belts, no pulleys, no clutches, and no air filters. In fact, there are no oils or liquids to leak or spill. Because of these many benefits, as well as the sustainability factors, facility managers at private colleges and universities are turning more often to green alternatives.



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Yale Replacing Grounds Equipment with Electric Alternatives

Yale Landscape and Grounds Management is taking the initiative to replace its gas-fueled and diesel-fueled equipment with electrically powered alternatives. The effort will improve air quality, reduce noise pollution, and help Yale in achieving its greenhouse gas emissions reduction commitment.

The effort began earlier this year, when Dev Hawley, Director at University Planning & Facilities Operations, actively began researching electric alternatives to gas backpack blowers. He expressed that while the gas equipment is effective, it is loud and emits fumes that are harmful to the environment. "Electric not only helps from an emissions point of view, but it also helps with noise because the electric equipment is generally a lot quieter," says Hawley. "We're in a learning environment where we don't really need a leaf blower or lawn mower creating lots of noise right outside of the classroom."

By reducing localized emissions and cutting back on noise, the initiative will also benefit the health and well-being of the Facilities grounds staff. Working with Paul Catalano, Director of Grounds Maintenance, he put together an inventory of current grounds equipment. Yale has over 30 backpack blowers, along with a large quantity of augers, handheld blowers, tractor lawn mowers, push lawn mowers, chainsaws, hedge trimmers, string trimmers, leaf vacuums, and sweepers. To help manage its property of over 1000 acres, Yale also hires contractors. Any equipment that Yale replaces for electric will also need to be replaced by the contractors.

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When considering alternatives, they looked into the price and performance of the equipment. They asked questions such as: Does the land mower cut as fast and collect the grass as well? Does the electric blower blow the leaves when the leaves are wet? While the market for electric grounds equipment is currently in a state of development and transition, they found areas of opportunity. Without any major performance compromise, they found replacements for about half of their inventory including handheld blowers, chainsaws, push mowers, hedge trimmers, and string trimmers.

When it came to backpack blowers, they were not convinced that the electric alternatives would have ample power to perform the job efficiently. They decided on replacing half of the backpack blower supply with electric alternatives to test their performance this fall. Hawley expects the equipment will measure up so that they can replace the remaining supply next year.

One of the challenges that comes with the switch to electric is batteries. For the equipment to last during a day's worth of work, the battery needs to be charged midway. To account for this, Yale will install a battery station at the main Grounds Management office with



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LAWN MOWER EMISSIONS FACTS

According to an EPA study, one 3 hp lawn mower emits the same air pollution as 11 cars driving at 55 mph. Each additional hp is calculated with a linear use equation.

Each 1 hp from a lawn mower = 3.67 cars at 55 mph emissions

Commercial ZTR gas mower

24 hp commercial ZTR mower = 88 cars at 55 mph emissions
(= 4,840 car miles each hour)

24 hp ZTR mower @ 3.5 Hrs (national average/day) = 308 cars at 55 mph/day
day = 16,940 miles car emissions/day

24 hp ZTR used 350 hours/year = 1,694,000 car miles of emissions/year
1,694,000/12,000 miles (average annual car miles) = 141 car emissions per year for each commercial ZTR mower

Residential gas riding tractor mower

18 hp riding mower = 66 cars at 55 mph emissions
(= 3,633 car miles each hour)

18 hp riding mower @ 1.5 hrs (national average/week) = 99 cars at 55 mph/week
week = 5,445 miles car emissions/week

18 hp riding mower used 50 hours/year = 181,650 car miles of emissions/year

enough batteries to act as replacements throughout the day. This initiative is a larger reflection of Yale Facilities' efforts to reduce its environmental impact and lower its carbon footprint, supporting Yale's commitment to reduce greenhouse gas emissions by 43% below 2005 levels by 2020, and achieve carbon neutrality by 2050.

As part of a Vehicle Replacement Program for 2017, Yale Facilities needed to replace 20 fleet vehicles. After researching alternatives, they were able to replace 13 vehicles with hybrid models that would take advantage of a propane fueling station installed nearby this past summer. "That again is sending the message that Yale Facilities is going to drive as a priority a much more sustainable solution to everything we do, and we're really taking it from trucks all the way down to the string trimmer," says Hawley.

The new electric grounds equipment will be up and running by the end of this calendar year. For the remaining equipment, Yale will continue to research alternatives and expects to make progress each consecutive year. Yale is committed to building a more sustainable world. By doing what we do best—integrating science, the humanities, and our community—Yale creates, tests and adopts innovative solutions to the environmental and social challenges we all face.

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