

DER

Massachusetts Department
of Energy Resources

Electrify the Landscape:
Battery-Powered Landscaping
Equipment and Non-Plated Vehicle
Ride and Drive

Agenda

9:30-10:15: Landscaping and Non-Plated Vehicle Electrification Overview

- Why Go Electric: Environmental, Health, and Financial Benefits (Ryan Kingston, LBE)
- Tools to Electrify Your Tools (Morgan Bowler, LBE)
- FAC116: Lawns and Grounds Equipment, Parts and Services (Mike Barry, OSD)
- Kick-Off the Event (Julia Wolfe, OSD)

10:15-12pm: Ride and Drive

- Test battery-electric equipment offered through Statewide Contract FAC116
- Speak with FAC116 vendors
- Engage with presenters

Who's in the Room?

Municipalities

State Agencies

Authorities/Nonprofits/Others

Vendors



Do you currently use
battery-powered
landscaping equipment
(BPPE) at your facility?



What is your top barrier to transitioning to BPLE at your facility?



Upfront costs



Ongoing costs



Poor performance of BPLE



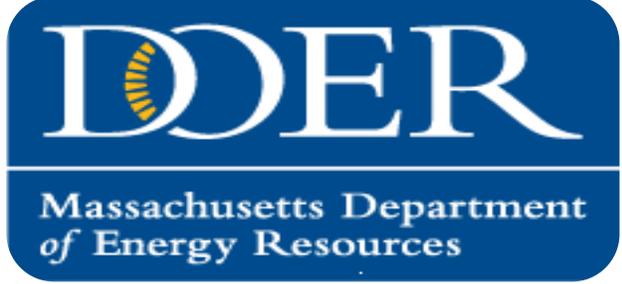
Lack of product availability



Lack of buy-in or support from internal staff



Others?



Why Go Electric?

The Triple Bottom Line

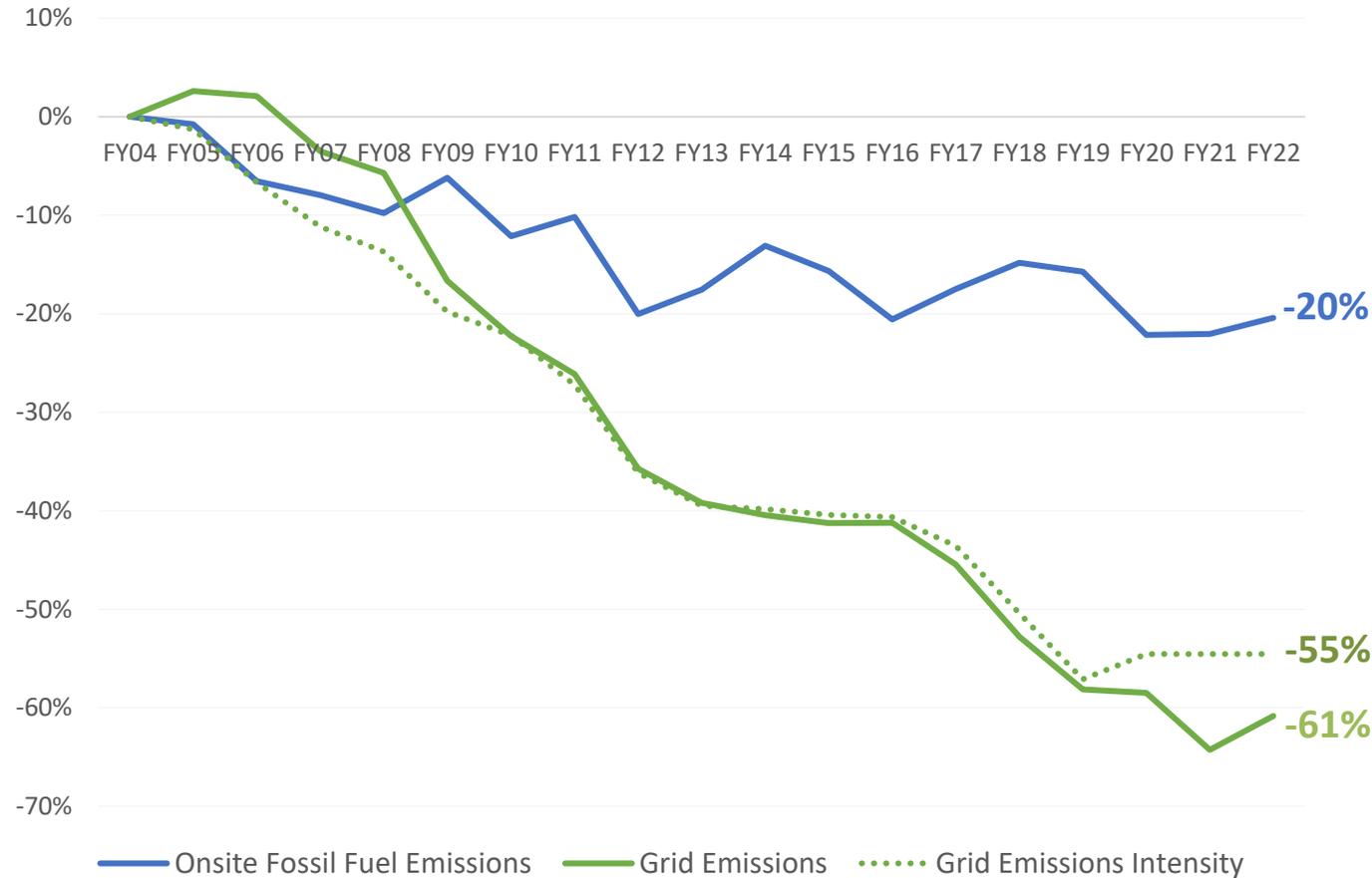
Environmental



Decarbonizing Landscaping Equipment

- MA net-zero emissions target by 2050
 - 2050 Decarbonization Roadmap
 - 2025/2030 Clean Energy and Climate Plan
 - First ever Climate Chief
- Executive Order 594 directs state agencies to reduce emissions from onsite fossil fuels by 95% by 2050
- BPLE can help you eliminate fossil fuel use from leaf blowing, tree trimming, lawn mowing, and transportation!

State Government Emissions from Grid Electricity vs. Onsite Fossil Fuels



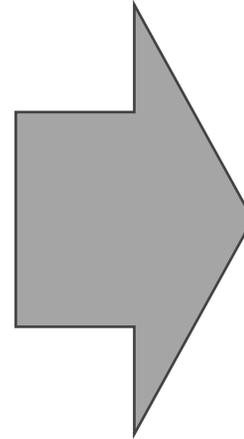
State government emissions from the grid have gone down by 61% largely thanks to the greening of the grid. Emissions from onsite fossil fuel use have declined only 20%.

Improve Employee (and Resident) Health and Wellness



Gas lawn equipment accounts for ~13% of all nonroad PM emissions ([Quiet Communities](#))

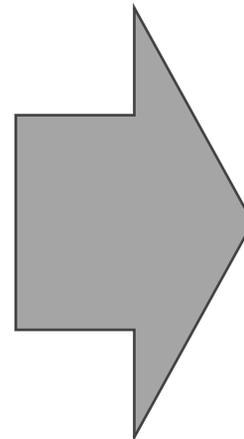
Gas mowers produce 11X as much pollution as a new gas-powered car (EPA; [CleanTechnica](#))



BPLE has zero onsite emissions of any kind, and doesn't require storage of fuels and chemicals



Several types of equipment above hazardous noise levels (85dBA). E.g: Push mowers (86-92), leaf blowers (95-106), chainsaws (105-109) ([CDC](#))

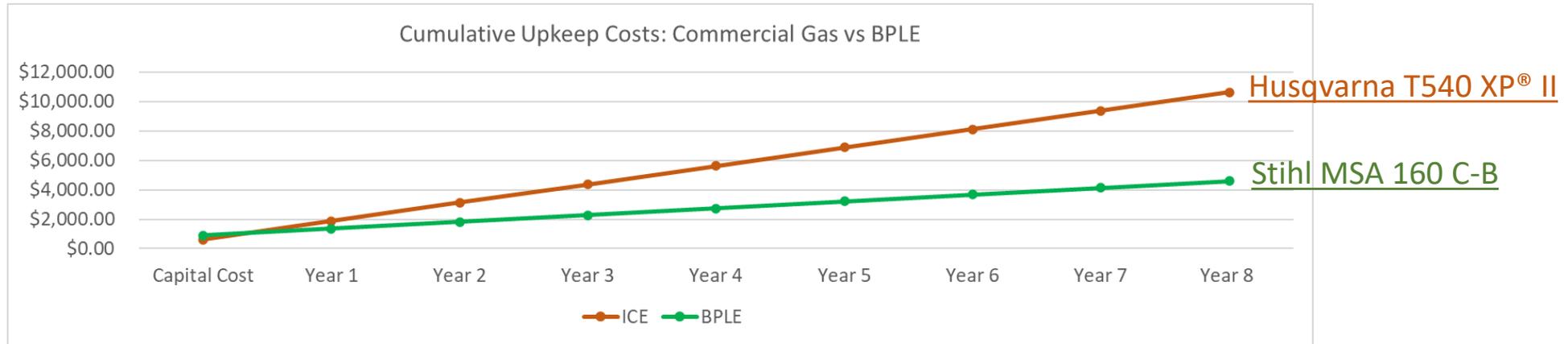


BPLE is quieter; battery electric blowers, for example, were found to be 4-22 dBAs lower than gas-powered counterparts ([ResearchGate](#))



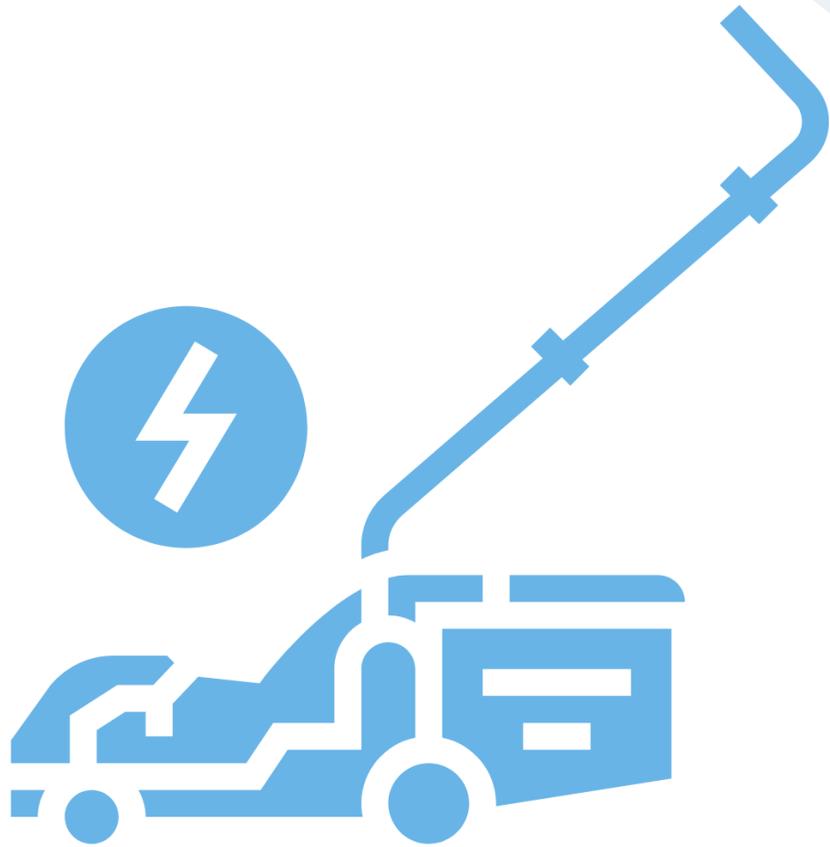
Go Green and Save Green

- BPLE is reaching (or has reached) cost-parity with gas landscaping equipment



- Real-world analysis found handheld BPLE has break-even point with gas equipment in <1-3 years; mowers closer to 2,500 hours ([Turf Magazine](#))
- Cost-savings go beyond fuel-use reduction
 - Fewer moving parts = less maintenance
 - No gas cans
 - No chemicals needed for spill cleanups
- Incentives are available!

*Graph created using LBE-OSD Gas to BPLE Savings Calculator



And the equipment
performs well too!

But don't take our word for it...

Wachusett Goes Electric (1:25)



MA Landscaping Company Goes Electric (3:05)



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Tools to Electrify Your Tools

BPLE Savings Calculator

Live on the LBE website

Step 1	Select Equipment	Chainsaw 14"
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Step 2 Select "Yes" for each area to use default values for battery-powered equipment option. Select "No" to input your own values in Column F.

Step 3 Select "Yes" for each area to use default values for commercial gasoline equipment option. Select "No" to input your own values in Column P.

Commercial Battery-Powered			
	Default Data	Use Default Data?	Input (if Default not used)
Price of Equipment	\$690.00	Yes	
Mass Save Rebate*	\$30.00	Yes	
Prompt Pay Discount	use drop down --->		1%
Add-ons	<i>Include total cost of any additional features, such as extra chargers, lights, solar canopy, etc</i>		
Additional Number of Batteries to be Purchased	use drop down --->		1
Cost per Additional Battery	\$240.00	Yes	
Equipment Specifications			
Battery size (kWh)	0.216	Yes	
Electricity Information			
Electricity cost (\$/per kWh)	\$0.16	Yes	
Hours of Operation			
Hours per day	use drop down --->		8
Days per month	use drop down --->		15
Months per year	use drop down --->		6
Warranty			
Length of warranty (years)	use drop down --->		3

ICE			
	Default Data	Use Default Data?	Input (if Default not used)
Price of equipment	\$630.00	Yes	
Prompt pay discount (PPD)	use drop down --->		1%
Add-ons	<i>Include total cost of any additional features, such as extra lights, etc</i>		
Equipment Specifications			
Horsepower	2.4	Yes	
Gallons of gasoline per hour	0	Yes	
Fuel Information			
Price per gallon of gas	\$3.38	Yes	
Hours of Operation			
Hours per day	8.0	Yes	
Days per month	15.0	Yes	
Months per year	6.0	Yes	
Warranty			
Length of warranty (years)	n/a use drop down --->		3

Don't know kWh but know amp hours (Ah) and Volts (V)? Multiply Ah by V and divide by 1000 to estimate kWh.

Don't know your equipment's horsepower but know its engine size, often show as "CC"? To calculate average horsepower, divide the engine size (CC) by 15.5.

Now let's see it in action ...

Rebates and Incentives

Mass Save Residential and Commercial Rebates

Residential:

- Lawnmower: \$75
- Leaf blower: \$30
- String Trimmer: \$30
- Chainsaw: \$30



EGO Select Cut 21"



Greenworks 82V
Handheld



Stihl MSA 300 C-O

Commercial:*

- Lawnmower: \$3,500
- Leaf blower: \$100
- String Trimmer: \$100
- Chainsaw: \$100



Toro Z Master Revolution



EGO Commercial 800 CFM

*To be identified as commercial according to Mass Save Rebate, battery powered lawn mowers must have battery capacity greater than 7kWh, while leaf blowers, string trimmers, and chainsaws must have a battery capacity greater than 0.5kWh.

Examples of BPLE eligible for Mass Save Commercial



Greenworks OptimusZ 60"

- Deck Size: 60"
- Batteries included: 1
- Combined battery capacity: 18 kWh
- Runtime: 6 hours
- Coverage: 16 acres
- Charging time: 2.5 hours
- Price: \$23,000

Examples of BPLE eligible for Mass Save Commercial



EGO Commercial 800cfm Backpack Blower

- Air Flow Volume: 800cfm
- Batteries included: 2
- Combined battery capacity: 1.12kWh
- Runtime: 120 minutes on low, 30 minutes on high, and 25 minutes on turbo
- Charging time: 60 minutes per battery
- Price: \$1,299*
- Price for extra battery: \$499

*Dependent on dealer

[Learn More](#)

Examples of BPLE eligible for Mass Save Residential



EGO Select Cut 21" Push Mower

- Deck Size: 21"
- Batteries included: 2 56V 10AH
- Combined battery capacity: 1.12 kWh
- Runtime: 75 minutes on single charge of each battery
- Charging time: 60 minutes per battery with included charger
- Price: \$1,099*
- Price for extra battery: \$499

Examples of BPLE eligible for Mass Save Residential



EGO 82V Handheld Brushless Axial Blower

- Air Flow Volume: 760cfm
- Batteries included: 1
- Combined battery capacity: 0.328kWh
- Runtime: 18 minutes on high, 13 minutes on turbo, and 2 hours on low
- Charging time: 30 minutes
- Price: \$500*

Tool Barn Overview & Online Resources

- DCAMM's [Tool Barn Program](#) is a resource available to state agencies only, to better assist you in the repair and maintenance of your agency's facilities
- The program lends out a variety of tools and equipment to state agencies at no charge
- Tool Barn is located at DCAMM Central Region Office 220 Old Common Road
Lancaster, MA

Inventory: [Tool Barn Equipment Inventory](#)

Guidelines: [Tool Barn Guidelines](#)

Registration: [Toolbarn Request and Release Form](#)



**Gravely Pro Turn
EV60 Mower**



**Greenworks
V82
Backpack Leaf
Blower**

Questions: Michele Davis, Tool Barn Manager
Contact: michele.davis@mass.gov or 617.939.1063
Lancaster: 978.365.7352



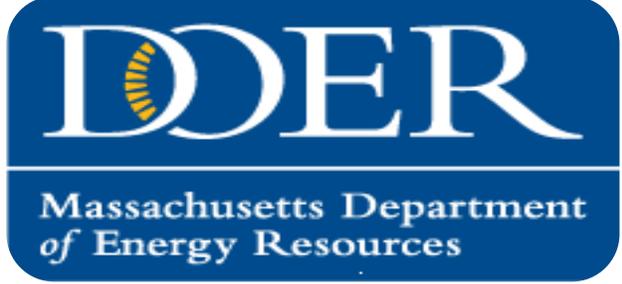
Additional Resources

- LBE Website
 - [LBE Sustainable Landscaping Page](#)
 - Includes recording from Sept 2022 ride and drive (user testimonies from DCR, Lexington, and Wellesley)
 - BPLE Flyers
- OSD:
 - [Commercial Battery Powered Equipment Webpage](#)
 - Specific help for Municipalities – contact your [OSD Local Government Enablement Team](#) Member for hands on assistance.
- DOER Green Communities Program
 - Department of Energy Resources’ Green Communities Coordinators provides technical assistance for clean energy and sustainability efforts.
- AGZA
 - Training: American Green Zone Alliance Service Pro Certification <https://www.sustainablelandcare.org/>

Battery-Powered Landscaping Equipment Resources Guide

DOER Leading by Example and OSD are working collaboratively to promote the adoption of battery-powered landscaping equipment (BPLE) at state facilities. BPLE offers a clean, emissions-free alternative to traditional gas- and propane-powered internal combustion equipment. Besides contributing to the Commonwealth’s decarbonization goals, this equipment offers numerous benefits including reduced operational costs and improved staff health and comfort. This guide is intended to summarize key resources to help state entities navigate the various educational resources, costs, benefits, incentives, and statewide contract availability.

Learn the Benefits	Compared to fossil fuel-based equipment, BPLE is quieter, smoother, easier to maintain, and produces zero onsite greenhouse gas and particulate matter emissions. Several resources are available to provide a deeper dive on the potential benefits to state entities: <ul style="list-style-type: none"> • Presentation from 2022 Ride and Drive event: Recording and Slides • Two-page flyer: Commercial-Grade BPLE for State Entities • OSD’s Environmentally Preferable Products Program • Leading by Example Sustainable Landscaping • External organizations: Quiet Communities and AGZA
Calculate Your Savings	Depending on the type of equipment, BPLE may have higher capital costs than traditional equipment. However, due to lower fuel and maintenance costs, BPLE often has a lower lifetime cost of ownership. Use the BPLE Savings Calculator to estimate the potential costs and emissions savings by switching to BPLE.
Test the Equipment	The DCAMM Tool Barn is a program available to state agencies to borrow and test equipment at no cost. The Tool Barn includes a battery electric backpack leaf blower, commercial push mower, and pro-turn mower. For the latest inventory, usage guidelines, and request form, see the Tool Barn Program website .
Leverage Statewide Contracts	BPLE is available for purchase via statewide contract FAC116: Lawns and Grounds Equipment, Category 8. Many vendors have demonstration equipment for potential buyers to test prior to purchase. The FAC116 contract user guide includes vendor contact information and instructions for using this contract. To ensure you are procuring commercial-grade equipment, consult the FAC116 Commercial Grade BPLE Specifications document on COMMBUYS .
Get a Rebate	Mass Save offers a \$3,500 rebate for the purchase of commercial-grade battery-powered lawnmowers with battery capacity greater than 7kWh, as well as \$100 rebates for leaf blowers, string trimmers, and chainsaws with battery capacity greater than 0.5kWh. Visit the Mass Save website for more information and rebate forms.
Report Progress	Did your entity purchase battery-powered equipment? What were your challenges? Success stories? Contact Ryan.Kingston@mass.gov to share your progress and discuss barriers.



Leveraging Statewide Contracts

FAC116: Lawns & Grounds Equipment, Parts and Services



- **Nine Contract Categories**
- **47 Vendors Total – manufacturer and independent dealer representation**
 - Category 3: Utility Vehicles, Golf Carts, Snowmobiles, and Related Accessories
 - Utility vehicles, ATVs, snowmobiles, golf carts, sprayers, groomers & sweepers
 - Category 8: Commercial Grade Battery Electric Lawn Equipment (26 Vendors)
 - Lawnmowers (including ride on), blowers, trimmers, chainsaws & more
 - Category 9: Equipment Leasing for Categories 1-8
- **FAC116 Contract Terms**
 - ✓ Term: May 1, 2021 – April 30, 2027
- **Competitive Pricing and Discounts**
 - ✓ Volume Discounts
 - ✓ Dock Delivery
 - ✓ Prompt Pay Discounts
- **OSD Climate Initiative**
 - ✓ Executive Order 604 – Establishing the Office of Climate Innovation and Resilience Within the Office of the Governor

Battery-Powered Equipment includes...

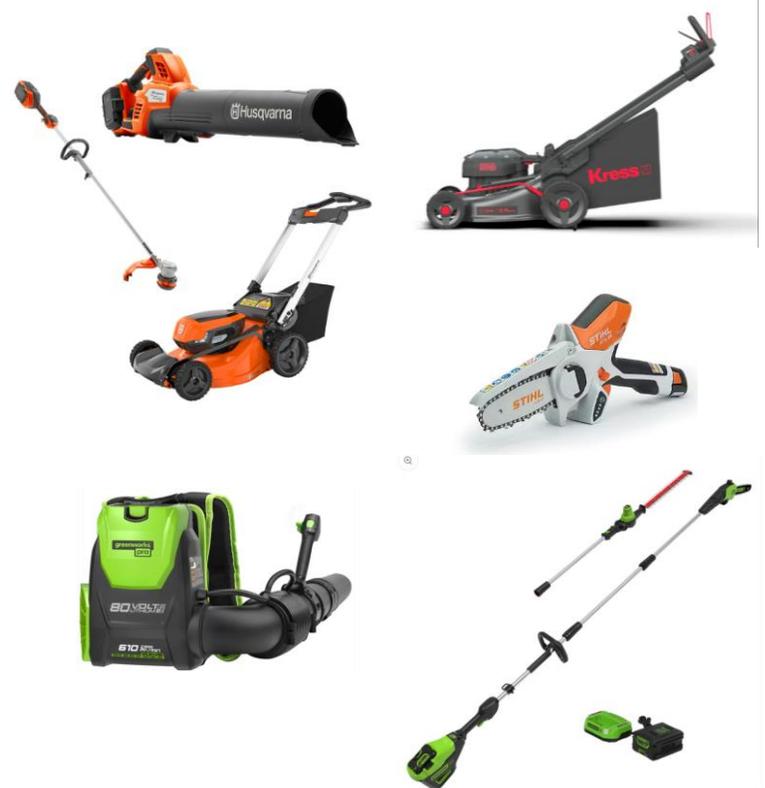
- Category 3: Electrify your fleet with a range of golf carts, shuttles, and utility vehicles



- Category 8: Ride-on and stand-on mowers



- Category 8: Handheld equipment and push mowers



Specs for Commercial-Grade Equipment

If buying *commercial-grade* battery-powered equipment, consider using [Commercial Grade Battery Powered Landscape Equipment Specifications](#) developed by OSD, including:

- Commercial-grade power (e.g. 12 HP for zero-turn mowers, 465 CFM for blowers)
- Low-noise
- Light-weight backpack batteries
- Minimum battery run times (e.g., 4+ hours for large mowers, 1.5+ hours for smaller mowers, 30+ minutes for handhelds)
- Those with *third-party certifications*



SPECIFICATIONS FOR COMMERCIAL GRADE BATTERY-POWERED ELECTRIC LAWN AND GARDEN EQUIPMENT

- If identifying an and how it is eq
- Identify if any o recycled conten
- 5. Low Noise
 - Mowers: By AN ear or at 50 ft
 - Blowers/Handh operator's ear a
- 6. Weight:
 - Backpack battery
 - o Backpack
 - o Handheld
 - Handheld with rs
- 7. Run times:
 - Mowers: 33", 3l
 - Mowers: 19", 2l
 - Blowers/Handh charge
- 8. Warranties: 2 years f
- 9. Evidence of Function
 - Field testing and performance (ir

BATTERIES AND CH

1. Certifications: Bt comply with all n
2. Safety: has recall
3. Chemistry: Lithi capacity battery
4. Voltages:
 - a. Mowers:
 - b. Blowers/
5. Lifetime: Measu gas counterparts
 - a. Mower b
 - i. :
 - ii. :

SERVICES AND P

1. Education: V equipment, t
 - a. Safet
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 - h. Fact
 - i. Mult
 - j. Conc
 - k. Infra supp
 - l. Ach
2. Vendor Prod and on-site fi work plan de
3. Parts and se (distributor/):
 - a. Venc

Converting from gasoline and propane to battery-powered landscaping equipment offers an opportunity to reduce the onsite combustion of fossil fuels and associated emissions from landscaping and lawn maintenance, while providing additional benefits to staff, the local community, and surrounding environment.

OSD offers many types of battery-powered landscaping equipment, including push mowers, walk-behind mowers, ride-on mowers, zero-turn mowers, blowers, string trimmers, and more on Statewide Contract FAC116: Lawns and Grounds Equipment, Parts and Services <https://www.mass.gov/doc/fac116/download>. This equipment has proven track records, performing as well as traditional equipment and meeting the gardening and landscaping needs of many state and municipal facilities across the Commonwealth. Visit the [EPP Program Commercial Battery Landscape Equipment](#) webpage for additional information on environmental, health, and cost benefits of battery-powered equipment.

Learn about [state entities currently using BPLE](#), including the Department of Conservation and Recreation, MassDOT Aeronautics, Massachusetts Community College, UNMass Amherst, UMass Lowell, and more.

Commercial-Grade Specifications to Consider in Your Quote
If buying commercial-grade battery-powered equipment, consider using the following specifications in your request for quotes:

EQUIPMENT

1. **Equipment Certification:** Equipment (minus batteries) with at least one of the following certifications: AGA Field Testing, UL, CE, TÜV/SVjg0j0g, or equivalent and comply with relevant ANSI standards and OSHA operator vibration and noise regulations (see [Appendix](#) for list of some of the equipment certification groups and links).
2. **Safety:** has mechanical and electrical recall history
3. **Commercial-grade Power** - All equipment is comparable in power to gas counterparts.
 - Mowers: At least equivalent to 12 HP for zero-turns, 4 to 7 HP for walk behind models
 - Blowers: At least 465 cfm volume, and 110 mph out of the nozzle
4. **Rugged Construction and Durability:** meet the following criteria for construction and durability:
 - Mowers: Steel deck and chassis, or equivalent strength material; no thin stamped deck or parts
 - Blowers: High-grade injection molding plastics, or equivalent strength material; metal construction
 - Other Handhelds: High-grade injection molding plastics, or equivalent strength material; metal construction

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Operational Services Division | One Ashburton Place, Suite 1017 | Boston, MA 02108 | 617-720-3300 | www.mass.gov/osd

Contract User Guide

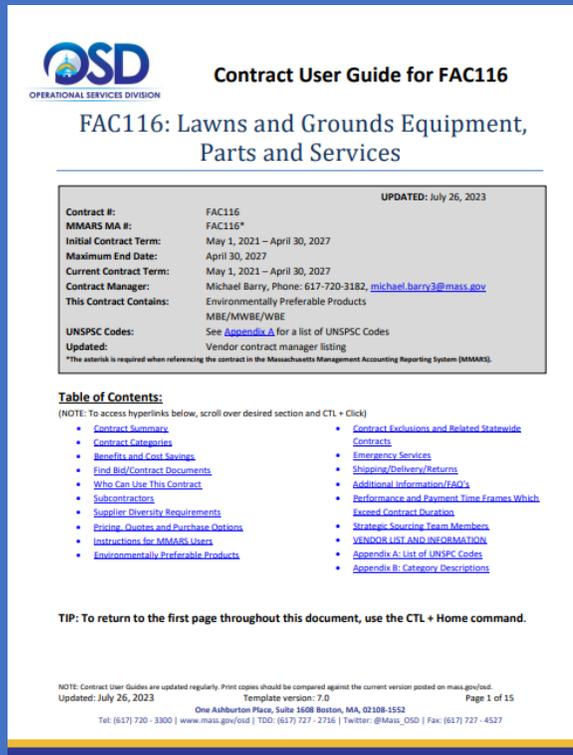
How to Learn More About the Contract?

The Contract User Guide is the buying guide for the contract that reviews:

- Contract Coverage
- How to Purchase
- Contract Exclusions
- Pricing and Quote Requirements
- Link to [commercial-grade specifications](#)
- Awarded Contractor Information – including links to their information in COMMBUYS

For more information:

- OSD Helpdesk - OSDHelpDesk@mass.gov or call 1-888-627-8283 or 617-720-3197
- OSD Contract Manager michael.barry3@mass.gov



OSD OPERATIONAL SERVICES DIVISION

Contract User Guide for FAC116

FAC116: Lawns and Grounds Equipment, Parts and Services

UPDATED: July 26, 2023

Contract #:	FAC116
MMARS MA #:	FAC116*
Initial Contract Term:	May 1, 2021 – April 30, 2027
Maximum End Date:	April 30, 2027
Current Contract Term:	May 1, 2021 – April 30, 2027
Contract Manager:	Michael Barry, Phone: 617-720-3182, michael.barry3@mass.gov
This Contract Contains:	Environmentally Preferable Products MBE/MWBE/WBE
UNSPSC Codes:	See Appendix A for a list of UNSPSC Codes
Updated:	Vendor contract manager listing

*The asterisk is required when referencing the contract in the Massachusetts Management Accounting Reporting System (MMARS).

Table of Contents:
(NOTE: To access hyperlinks below, scroll over desired section and CTL + Click)

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- [Subcontractors](#)
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- [Appendix A: List of UNSPSC Codes](#)
- [Appendix B: Category Descriptions](#)

TIP: To return to the first page throughout this document, use the CTL + Home command.

NOTE: Contract User Guides are updated regularly. Print copies should be compared against the current version posted on mass.gov/osd.
Updated: July 26, 2023 Template version: 7.0 Page 1 of 15
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Exhibitors

Exhibitors at today's event:

- Bacher Corporation of Connecticut
- Husqvarna Group
- MTE Equipment Solutions, Inc
- Boston Lawnmower
- Richey & Clapper, Inc
- Turf Products Corp
- CCE Golf Cars
- Norfolk Power Equipment Inc.

What types of equipment are you most interested in seeing/testing out?

Ride-on mowers

Stand-on mowers

Push mowers

Blowers

Chainsaws

Hedge trimmers

String trimmers

Electric utility vehicles

Others?

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