ORPA Leadership Academy 2024

EVALUATING BATTERY-OPERATED VS. GAS-POWERED EQUIPMENT

A Comprehensive Analysis

About Me

Mom to two crazy boys

Oregon State Alumni, baseball fan

Volunteer Coach

The Project

Phase 1

Identify key factors that decision - makers and fleet staff need to consider. Analyze pros and cons of each key factor.

Phase 2

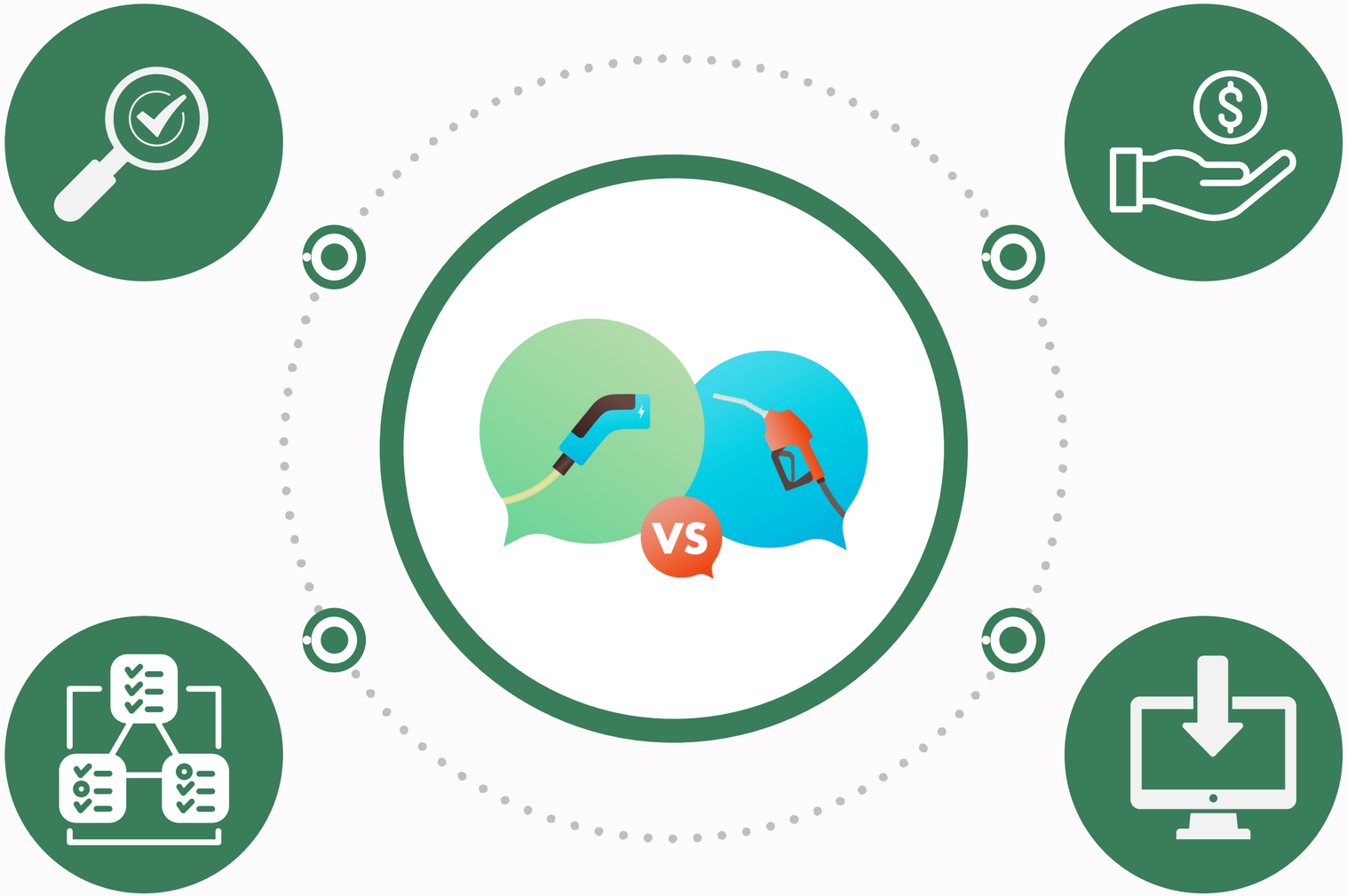
Cost Comparison of battery-operated equipment vs. gas-powered equipment.

Phase 3

Staff input from 2 different work groups.

Phase 4

Purchasing framework to help decision makers.



THE EQUIPMENT

String Trimmer

Backpack
Blower

Chainsaw

Riding Mower

Criteria To Consider

01 Performance

Cost 02

03 Environmental Impact

Convenience 04

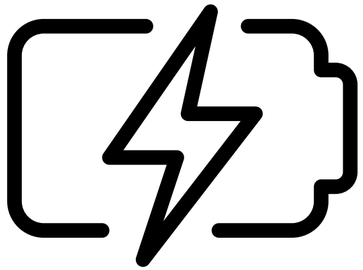
05 Versatility

Safety 06

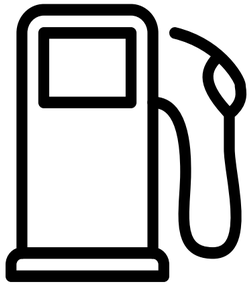
Factors To Consider

01

Performance
Pros and Cons



- Battery Pros:
  - Instant start
  - Comparable power for most tasks
- Battery Cons:
  - Limited Run Time
  - Potential Power Limitations
  - Dependency on Battery Life



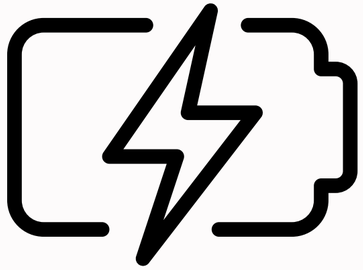
- Gas Pros:
  - High Power Output
  - Longer Run Time
  - Versatile
- Gas Cons:
  - Noisy Operation
  - Emissions
  - Regular Maintenance Required

Factors To Consider

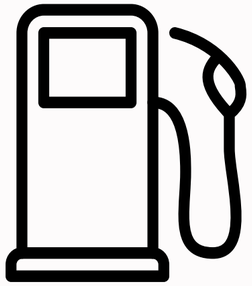
Cost

Pros and Cons

02



- Battery Pros:
  - Lower Operating Cost
  - Potential Long-Term Savings
- Battery Cons:
  - Higher Initial Investment



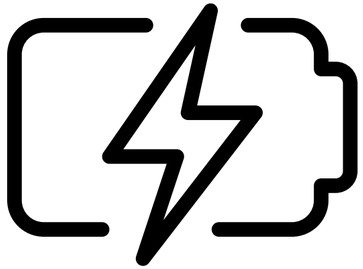
- Gas Pros:
  - Lower Initial Investment
- Gas Cons:
  - Higher Operating Costs

Factors To Consider

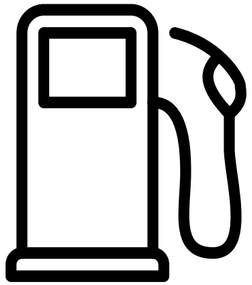
03

Environmental Impact

Pros and Cons



- Battery Pros:
  - Zero Emissions during Operation
  - Lower Environmental Footprint
- Battery Cons:
  - Environmental Impact of Battery Production & Disposal



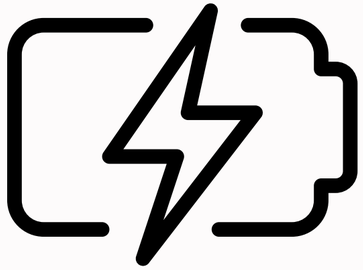
- Gas Pros:
  - Longevity and Durability
- Gas Cons:
  - Emissions During Operation

Factors To Consider

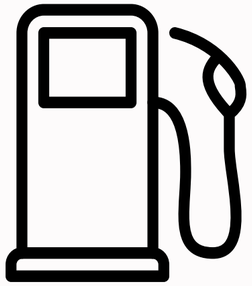
Convenience

Pros and Cons

04



- Battery Pros:
  - Easy Start-Up
  - Ease of Use
  - Lightweight
  - Minimal Maintenance
- Battery Cons:
  - Limited Runtime/charge time
  - Battery Lifespan



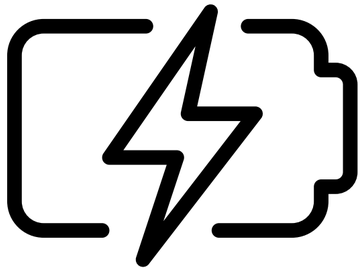
- Gas Pros:
  - Longer Runtime
  - Consistent Power Output
- Gas Cons:
  - Start-up Procedure
  - Noise and Vibration

Factors To Consider

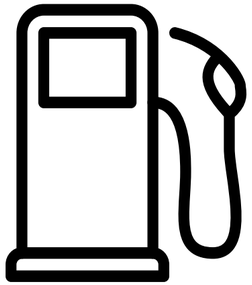
05

Versatility

Pros and Cons



- Battery Pros:
  - Versatile in Use
  - Portable
  - Multi-purpose batteries
- Battery Cons:
  - Limited Runtime
  - Less Power
  - Dependence on Charging

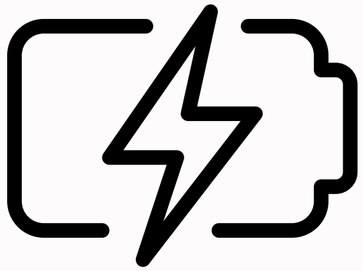


- Gas Pros:
  - High Power Output
  - Longer Runtime
- Gas Cons:
  - Limited Portability
  - Emissions & Noise
  - Maintenance Requirements

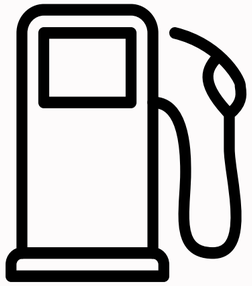
Factors To Consider

Safety
Pros and Cons

06



- Battery Pros:
  - Reduced Risk of Fire
  - Lower Emissions
  - Quieter Operation
- Battery Cons:
  - Risk of Electrical Hazards



- Gas Pros:
  - Longer Runtime
  - Higher Power Output for efficiency
- Gas Cons:
  - Using/Transporting Flammable Fuel
  - Exhaust Emissions
  - Noise and Vibration

Cost Analysis

String Trimmer	Battery-Powered Equipment	Gas-Powered Equipment
10 Year Life	Stihl FSA 135R String Trimmer	Stihl FS91R Weed Trimmer
Acquisition Cost	819.97	500
Fuel/battery replacement	459	1400
Energy	150	
Maintenance	0	550
Totals	$1,429	$2,450

Cost Analysis

Backpack Blower	Battery-Powered Equipment	Gas-Powered Equipment
10-year life	Stihl BGA300 Backpack Blower	Stihl BR600 Backpack Blower
Acquisition Cost	1,889.95	549
Fuel/battery replacement	2,600	6500
Energy	2222	0
Maintenance	0	750
Total	$6,711.95	$7,799

Cost Analysis

Chainsaw	Battery-Powered Equipment	Gas-Powered Equipment
10 year life	Stihl MSA 200 C-B 14in	Stihl MS250 Chainsaw
Acquisition Cost	669.89	349
Fuel/battery replacement	459	$362.70
Energy	752	0
Maintenance	350	1750
Total	$2,230.89	$2,461

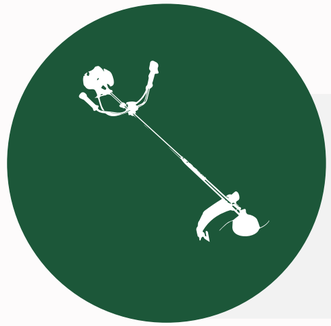
Cost Analysis

Riding Mower	Battery-Operated Equipment	Gas-Powered Equipment
10 Year life	MeanGreen EVO-74 mower	Groundsmaster 7210 Riding
Acquisition Cost	$49,940	$25,961
Fuel	0	7,218.8
Energy	3,018.4	0
Maintenance	3,000	10,350
Total	$55,958	$43,530

Staff Survey

Staff value the convenience, ease of use and enviornmental friendliness

Staff noted challenges with some equipment due to weight, battery life and performance.



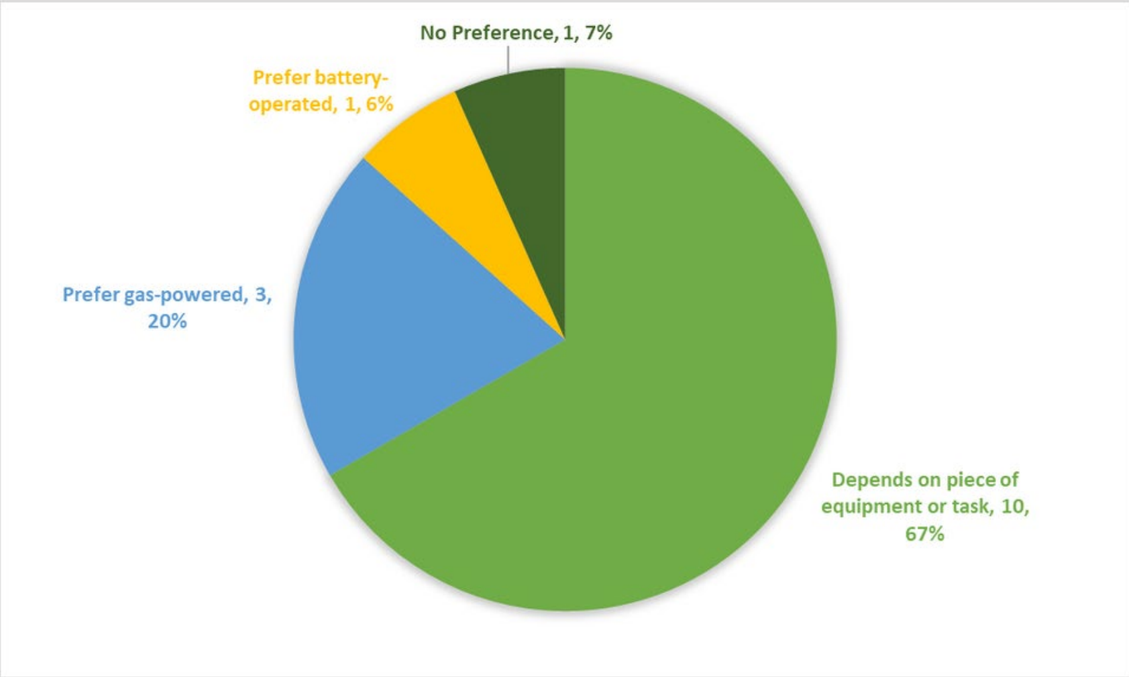
One of the most popular answers in the survey is that they are open to using certain equipment, depending on the task.

The majority of staff are optomistic about the improvement in technology for equipment and are open to working with the equipment.

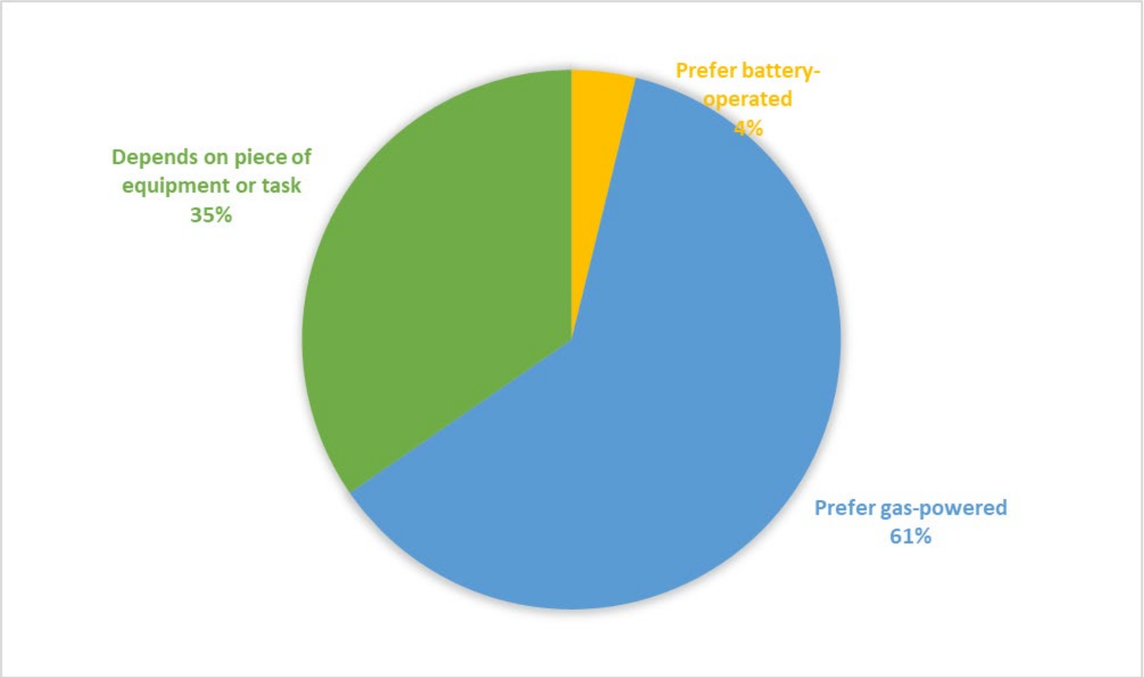
Staff Input

COMPARED TO TRADITIONAL GAS-POWERED EQUIPMENT, DO YOU PREFER USING BATTERY-OPERATED EQUIPMENT?

BPRD



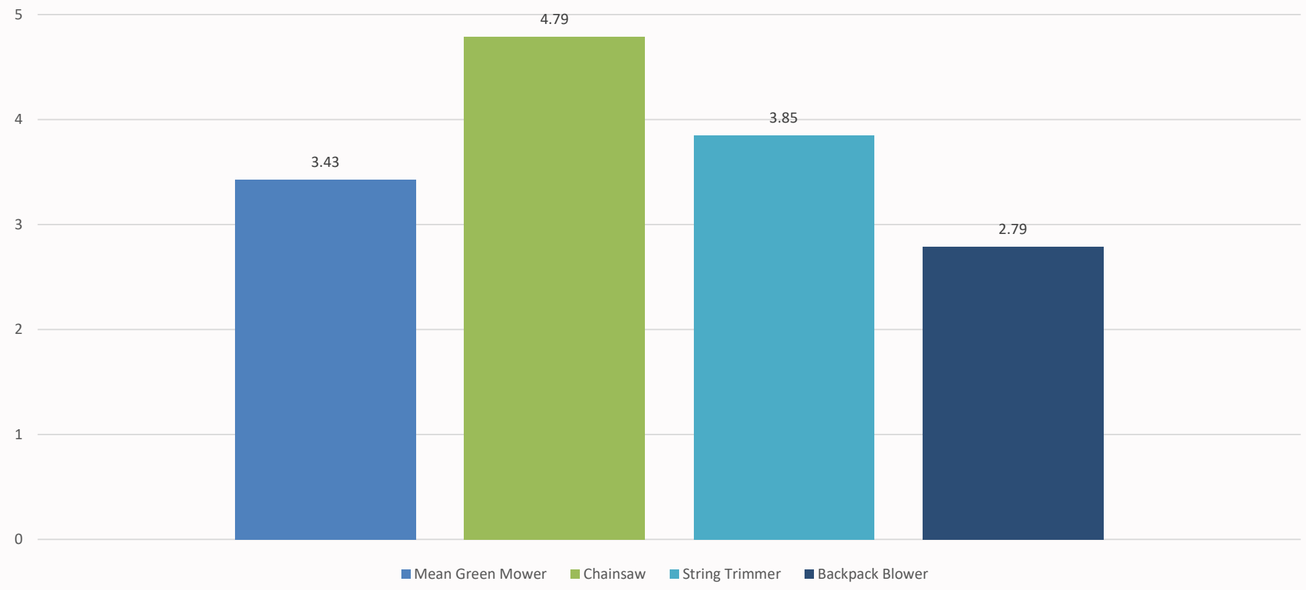
THPRD



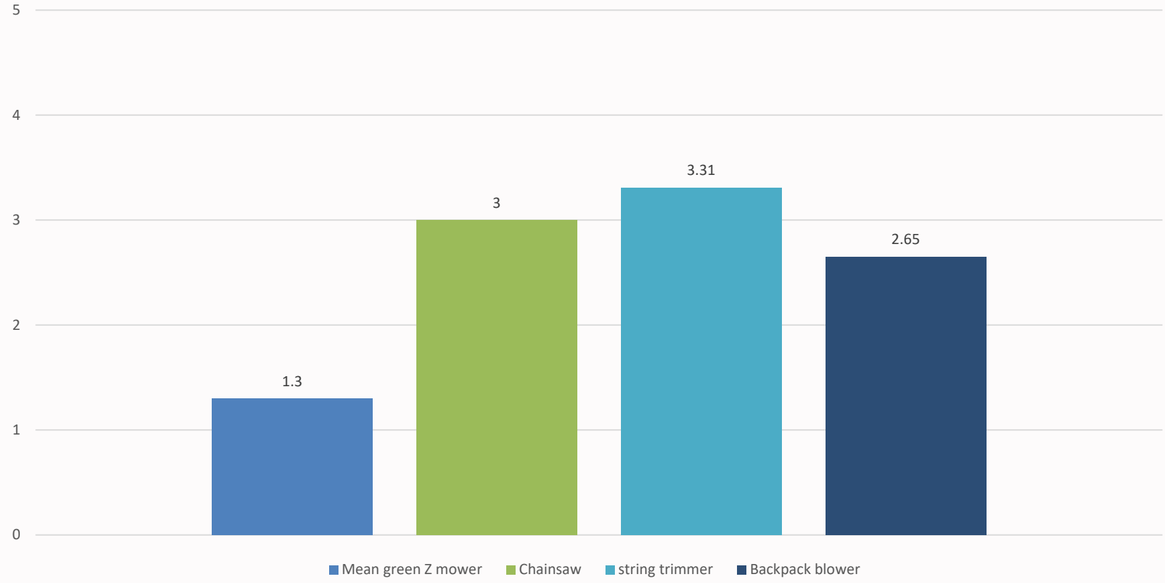
Staff Input

On a scale of 1 to 5 (1 being the worst, 5 being the best), how satisfied are you with the performance of battery-operated equipment you have used.

BPRD

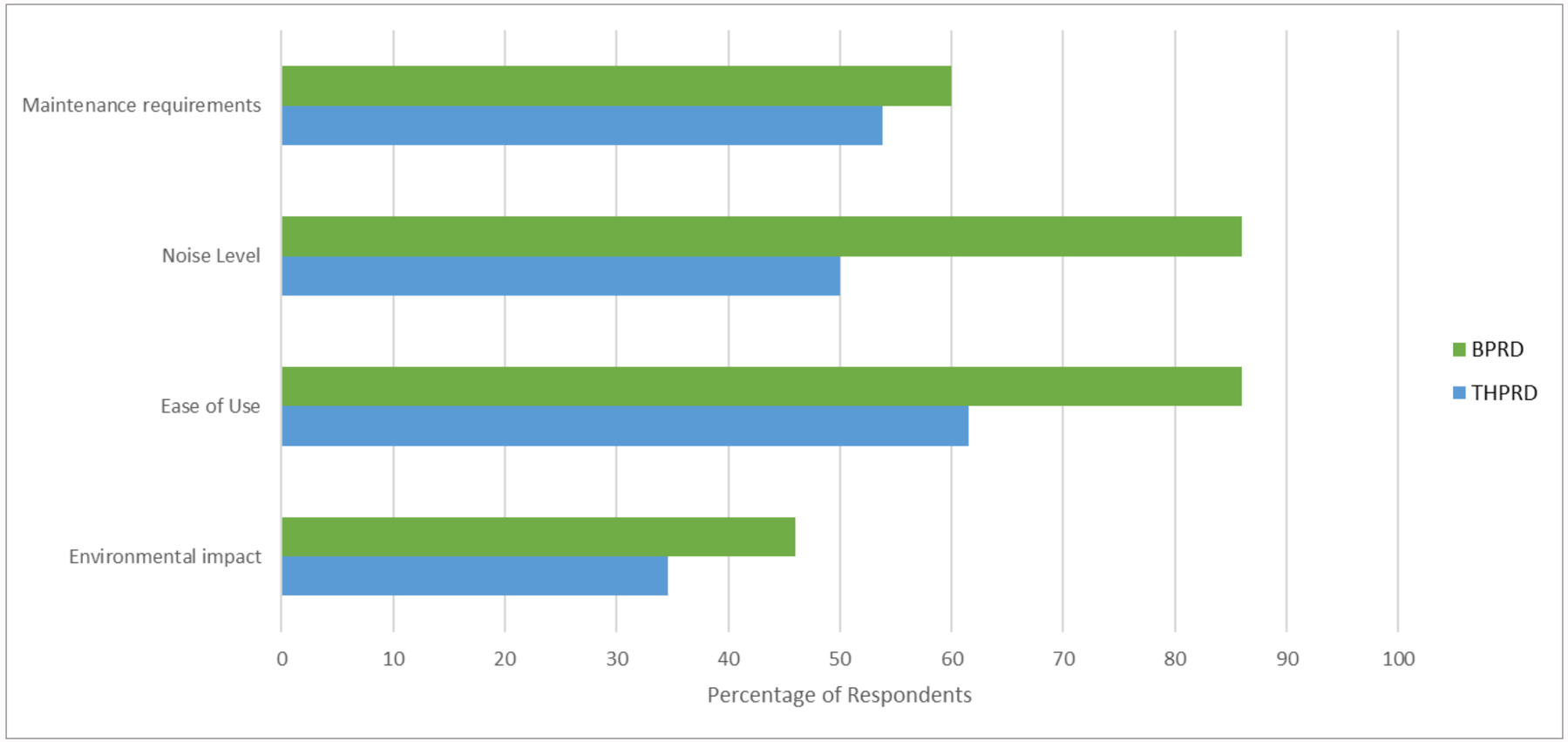


THPRD



Staff Input

What factors influence your preference for battery-operated or gas-powered equipment? (Select all that apply)



Purchasing Framework

Features:

Grading criteria that can be weighted

Score based on your agencies goals or the task the equipment will be used for.

Will help to guide you in your purchase.

Criteria	Weight	Battery-Operated Equipment	Gas-Powered Equipment
Performance Performance in equipment refers to its ability to meet or exceed certain criteria or standards in terms of efficiency, effectiveness, and reliability.	20%	8	9
Cost Cost plays a crucial role in assessing equipment purchases. It includes the initial buying price, ongoing operational costs, and maintenance expenses over time. Evaluating both the initial purchase price and the total cost of ownership is essential for gauging the economic feasibility and value of equipment investments.	15%	7	9
Environmental Impact This considers the equipment's effects on the environment, including factors such as emissions, noise pollution, and energy consumption.	20%	8	5
Convenience Convenience in equipment purchasing entails factors such as ease of use, accessibility, portability, maintenance, compatibility, and scalability. Evaluating convenience helps ensure that equipment investments align with operational needs, facilitate efficient workflows, and enhance user satisfaction.	15%	8	7
Versatility Versatility refers to the equipment's ability to perform multiple tasks or adapt to different conditions. Versatile equipment offers greater flexibility and can be more cost-effective than specialized equipment for various applications.	20%	7	9
Safety Safety is a critical aspect of equipment performance, encompassing features and design elements that mitigate risks to operators and bystanders during operation and maintenance. Safe equipment minimizes the likelihood of accidents, injuries, or occupational hazards.	10%	8	7

Project Outcomes and Lessons Learned

Outcomes:

There is no one size fits all. It is important to consider all of the factors.

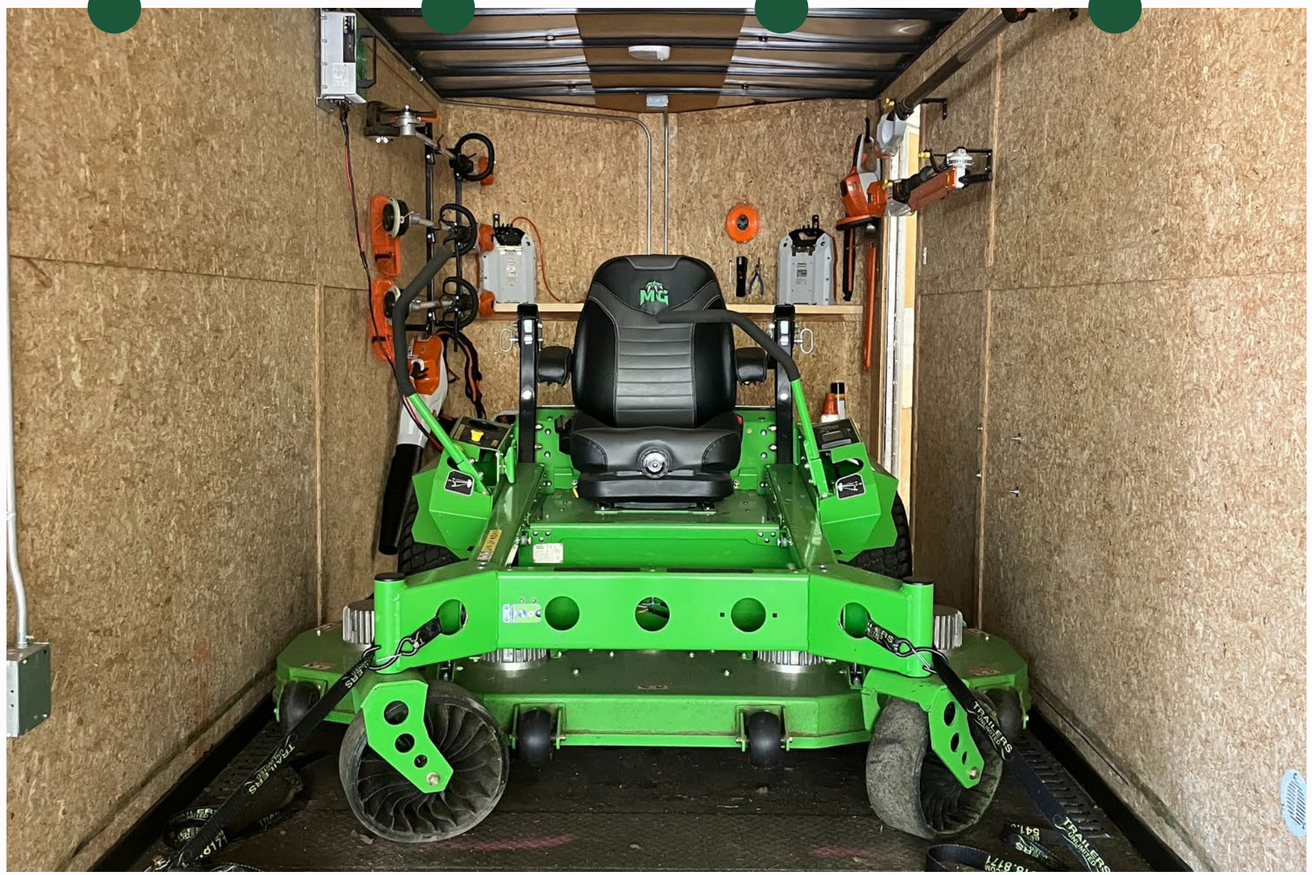
Battery-operated equipment is the future, however a balanced approach is important.

Lessons Learned:

Real world testing matters.

Adaptability is key.

Technology is improving, fast!



QUESTIONS?

THANK YOU