

Battery Operated Equipment | Summer 2013



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Building Services, Grounds and Event support, University services

Project summary

SP-0109

- *To purchase battery operated equipment for the Grounds Department. To be more sustainable and utilize battery operated equipment (leaf blowers) versus mixed fuel equipment.*
- *Air pollution will be reduced – mixed oil and gas equipment will be replaced by battery operated equipment.*
- *Noise pollution will be reduced by approximately 50%.*
- *Equipment will be safer for the employees: 1) enhanced performance, 2) battery operated leaf blowers are half the weight of the mixed oil and gas leaf blowers, 3) employees will no longer be inhaling mixed oil and gas.*
- *Reduction of complaints from the McGill community – noise pollution will be significantly reduced.*

Project eligibility:

- *How will the project contribute to building a culture of sustainability on campus?*
 - *Reduction of noise pollution, reduction of air pollution, safer for the employees*

Timeframe / Milestone:

- *It will take approximately 4-8 weeks for the delivery of the equipment.*
- *The number of complaints from the McGill community will be reduced. Noise and air pollution will be significantly reduced.*
- *Employees will no longer be inhaling mixed oil and gas and the weight of the battery operated equipment is half the weight of the existing equipment presently being used thus reduction of employee injuries, etc.*
- *We would like to work with the media relations department to get the message across to the community. In addition, we would like to work with various student groups to assist us with the message that the Grounds department is striving to be more sustainable and replacing mixed oil equipment with battery operated equipment.*

Project implementation:

Tasks and Responsibilities

Type of Activity – Task	Estimated Time Required	Group Member in Charge
To purchase battery operated equipment	Delivery of equipment approximately 4-8 weeks	Marc Dozois and Mika Varelas

Financials:

Cost of gas equivalent equipment

Expense Description	QTY	Estimated Cost	Total	Estimated cost	Total
Batterie Ultra Lithium 1100, 50.2V, 990 Wh, 23.2 Ah	5	1695.00	8,475.00	N/A	N/A
Sécateur Treelion M45 autonome (avec batterie) Ultra Lithium 200, 21 cm	1	2595.00	2,595.00	800.00	800.00
Sécateur Treelion D45-900, 90 cm	1	2095.00	2,095.00	800.00	800.00
Tronçonneuse Selion Manual M12, chaîne 6" (15 cm), 1200 W (1.63 ch)	1	1095.00	1,095.00	400.00	400.00
Tronçonneuse Selion Compact C20, chaîne 12" (30 cm), 2000 W	1	1495.00	1,495.00	700.00	700.00
Débroussailleuse/coupe-herbe Excelion, 1200 W, 1 à 1.5 m, Ø de coupe 18 à 30 cm	2	1395.00	2,790.00	700.00	1,400.00
Souffleur Airion, 200km/hr, 750W, 4 vitesses + 1 survitesse, 2.6 kg	2	1150.00	2,300.00	800.00	1,600.00
		Sous-total	20,845.00		5,700.00
		Transport	115.00		
		Taxes	3,138.76		
		TOTAL	24,098.76		

Financials:

Revenue Source	Amount Requested	Confirmed?
Sustainability Projects Fund	\$24,000.00	Yes

Annual cost analysis for gas equipment (average):

Description	Cost per Liter	Qty per day	Cost for 1 day	Cost for 120 days*	Other costs	
Gas	1.36	38.4 **	52.22	6,266.88 (A)		
Oil	5.99	.96 ***	5.75	690.05 (B)		
Annual maintenance cost for gas equipment					1,200.00 (C)	
Purchasing cost of gas equipment					5,700.00 (D)	

* Average use of tools per year

** Fuel consumption based on the following:
 0.6Liter/hour, average motor size 22.5cc and 8hrs per day

***Based on gas/oil ratio 1/40

Description	Cost	
First year cost of using gas equipment	13,856.93	(A) (B) (C) (D)
Cost per additional year	8,156.93	(A) (B) (C)

Note: Cost analysis based on 8 pieces of equipment

Cost / Savings report:

Year	(Cost) / Savings
1 year	(6,988.07) \$
2 years	1,168.86 \$
3 years	9,325.78 \$
4 years	17,482.71 \$
5 years	25,639.64 \$
6 years	33,796.57 \$
7 years	41,953.50 \$
8 years	50,110.42 \$
9 years	58,267.35 \$
10 years	66,424.28 \$

Amortization period:
22.3 months

Battery operated tools



Airion air blower



Treelion tree pruning shears



Excelion brush cutter



Selion C20 handheld chainsaw



Ultra Lithium
1100 battery



Selion M12 chainsaw



Treelion tree pruning shears

> Recommendations

1. Good equipment
2. Eco-friendly
3. User-friendly and lightweight
4. Very convenient: the same battery pack can be used with all tools
5. Good return on investment (22 months)
6. Minimal maintenance care
7. Good service from the supplier

> Conclusion

Challenges:

- It was difficult to find the right equipment that hold their battery charge long enough to meet our requirements.
- Also finding tools that have enough power to perform all of our tasks similar to the gas equipment performance.

Positive outcomes:

- Air pollution reduced / Noise pollution reduced as well:
 - This allows us to use this type of equipment more freely during daytime
 - Efficiency increase compared to manual tools
- Safety of use:
 - No gas to be carried
 - Employees and McGill community not exposed to fume
 - No idling, less risk of injuries while operating tools
- User friendly:
 - Easy start (no pulling needed)
 - Weight load more balanced vs gas equipment
 - Less strength required (ex: tree pruning tool)

> Conclusion

Issues and future requirements for project success implementation:

1. Reviewing the whole process of an on-site operation of battery operated equipment:
 - a) Some of our tasks still require more power: in need of more powerful battery operated equipment (ex: blower, chainsaw).
 - b) Grounds employees occasionally will need to be reminded to choose the battery operated equipment instead of the gas equipment.

2. The following issue prevents us from sometimes using the equipment at full capacity:
 - a) Sometimes employees tend to forget to charge the battery packs.