

Company Information

Company Name	<i>Husqvarna Professional Products Inc.</i>	Date Submitted	<i>11/12/2021</i>
Project Title	<i>In Field Fleet Battery Charging Solution (HUSQ_BATTERY)</i>	Planned Starting Semester	<i>Spring 2022</i>

Senior Design Project Description

Personnel

Typical teams will have 4-6 students, with engineering disciplines assigned based on the anticipated Scope of the Project.

Please provide your estimate of staffing in the below table. The Senior Design Committee will adjust as appropriate based on scope and discipline skills.

Discipline	Number	Discipline	Number
Mechanical	2	Electrical	2
Computer	1	Systems	
Other ()			

Company and Project Overview:

Husqvarna Group



Husqvarna Group is a leading global producer of outdoor power products for forest, park and



garden care. Our strong technical expertise and passion for innovation and quality create performance, pride and improved results for customers.

The Group is also the European leader in garden watering products and a global leader in cutting equipment and diamond tools for the construction and stone industries. The Group's products and solutions are sold under brands including Husqvarna, Gardena, Redmax, Flymo, Zenoah and Diamant Boart via dealers and retailers to consumers and professionals in more than 100 countries. Net sales in 2020 amounted to SEK 42 billion and the Group has around 12,000 employees in 40 countries.

The North American Division of the Husqvarna Group has its headquarters located in Charlotte, NC. The NA Division aims to be the leading forest and garden supplier for the broad mass consumer segments.

Products are sold mainly through retailers such as Lowe's and TSC in the US and Castorama and B&Q in Europe. The retail landscape is highly consolidated in North America and competition in the mass consumer segment is fierce with a strong emphasis on price. The estimated addressable market amounts to SEK 70bn, of which more than 60 percent is in North America and slightly less than 30 percent is in Europe.

The industry is seeing continued growth in the transition from petrol outdoor power equipment to battery outdoor power equipment, especially in the consumer segment. There are still roadblocks for commercial operators to adopt battery technology. Specifically, the fear of not having enough power to last through an entire day of work. As professional landscapers transition to battery power equipment, there becomes a need for in field charging to ensure that there is never any downtime.

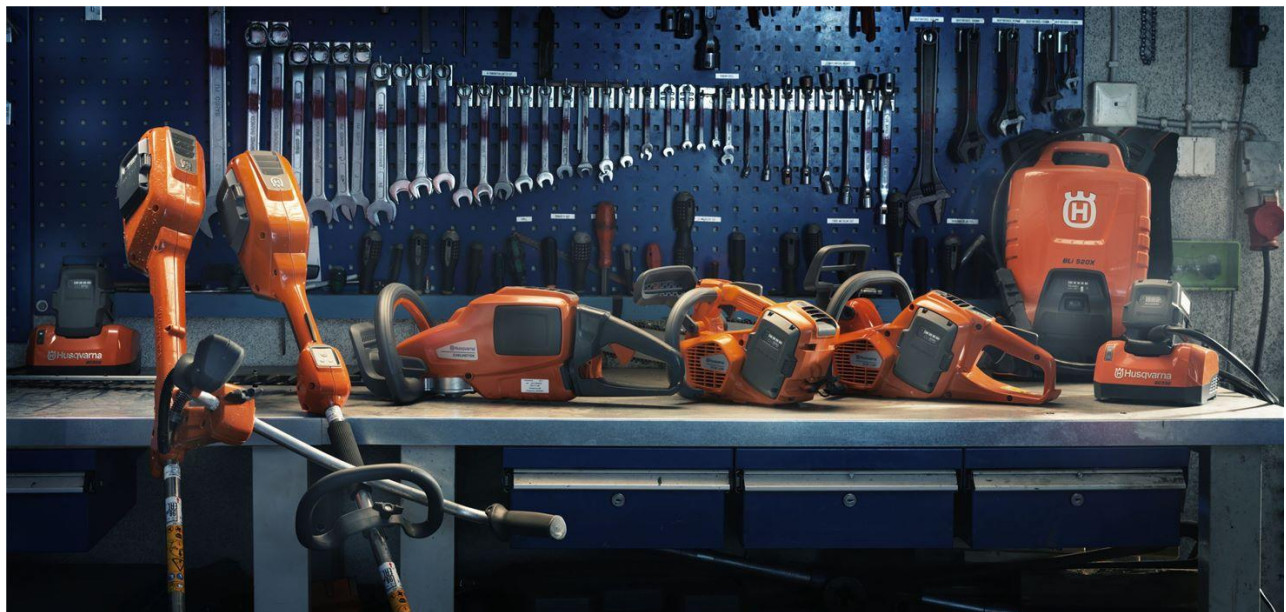


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Project Requirements:

Husqvarna will provide the UNC Charlotte Senior Design Team with the battery specification for the BLi300 and typical daily usage for a commercial landscape crew. The design team will be responsible for analyzing the power consumption and recharge times to spec and build a commercial in field charging solution. The solution must be able to recharge 6 BLi300 batteries from 0% to 100% with 1,000W charger free from any external power source (stored energy transfer). The solution must be able to recharge 6 BLi300 batteries up to 3 times per day. The design must be able to recharge the external power source overnight from a standard 110V or 220V outlet. Lastly, the design must allow for expansion.





Expected Deliverables/Results:

- Must be able to recharge 6 BLi300 batteries from 0% to 100% with 1,000W charger free from any external power source (stored energy transfer).
- Must be able to recharge 6 BLi300 batteries (3) times per day.
- Must be able to recharge external power source overnight (10 hour)
- Must be able to recharge external power source from standard 110V/220V outlet.
- Design must be expandable to allow for multiple (3) power banks per trailer.
- Working prototype

Disposition of Deliverables at the End of the Project:

- Any hardware or software developed by the UNC Charlotte senior design team is the property of Husqvarna. The hardware and software will be handed over to Husqvarna at the conclusion of the final Design Expo unless otherwise noted.

List here any specific skills, requirements, specific courses, knowledge needed or suggested (if none please state none):

- 3D CAD Modeling
- Electric circuits
- Fabrication
- Embedded software