



PROJECT SOLUTION PROPOSAL AND FEASIBILITY ANALYSIS



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SUMMARY

This report outlines three pioneering solutions aimed at revolutionizing the electric vehicle (EV) charging infrastructure in Canada.

- **Peer-to-Peer and Dedicated Network Charging Stations:** By combining a peer-to-peer (P2P) platform with a dedicated network, this solution enhances accessibility and convenience for EV owners. Individuals and businesses can list their chargers for booking or request installations, while the company establishes public charging stations in high EV adoption areas.
- **Lamp Post EV Charging:** Redesigning the existing streetlights into charging stations with the help of charging technology makes it a cost-effective and space-saving charging option. Lamp post chargers offer a seamless and safe charging experience by integrating payment and access control features.
- **Aggregation through Predictive Modelling Services:** The maintenance and functionality of current charging stations are optimised using predictive modelling techniques. A complete mobile app for EV users helps them locate nearby stations and estimate charging times, whilst a specialized platform for charging station owners provides real-time performance data and predictive maintenance notifications.

Collectively, these innovative solutions aim to address challenges in accessibility, maintenance, and infrastructure deployment, fostering widespread EV adoption and sustainability initiatives throughout Canada.

Solution 1: ChargeUp- Where P2P meets D2C!

PEER-TO-PEER AND DEDICATED NETWORK CHARGING STATIONS

Solution Description:

Functionality:

This solution aims to create a hybrid peer-to-peer (P2P) and dedicated network of electric vehicle (EV) charging stations across Canada, and even penetrating regions with low EV charging networks.

P2P network: Individuals, and businesses (restaurants, hotels) with existing Level 2 chargers can list them on the platform for booking by EV users. They can also request us to install a charging station for them.

Dedicated network: The company will also try to establish its network of public charging stations in high EV adoption areas.

Features:

- Mobile app for user booking as well as host management.
- Location-based search for available charging stations.
- Slot booking and payment system.
- Pricing is based on location, time, availability, amenities, and energy usage.

Target Application:

All EV owners in Canada, particularly those in regions with limited charging infrastructure. Also incentivizing non-EV owners through the host portal.

Technical Specifications:

Mobile app, online platform for host registration, verification, and management, backend system for bookings and payments, integration with existing charging station protocols (if applicable).

Market Need & Stakeholders

Market Need:

From our research, we have noticed a lack of EV charging networks outside a few cities. This may be due to a lack of EV adoption in this region. We want to enter this market with low competition to establish our brand.

As the EV market is growing steadily. This network will also encourage existing EV owners to travel nationwide without hesitation, establishing a stronger bond with our customers, especially in regions of EV dominance.

Stakeholders:

- *EV Owners (Users):* Easy access to charging stations in underserved areas.
- *Hosts (Individuals, Businesses):* Monetize unused charging capacity.
- *Utilities:* increased demand for electricity (potential partnership).
- *Government:* supports EV adoption and infrastructure development (potential funding).

Impact on Stakeholders:

- *EV Owners:* Increased convenience and accessibility of charging, potentially lower costs in some cases.
- *Hosts:* Additional income stream, potential customer traffic (restaurants, hotels).
- *Utilities:* Increased electricity sales, potential for grid optimization partnerships.
- *Government:* Promotes EV adoption, and aligns with sustainability goals.

Market Opportunity

Market Size:

Projected EV Sales Growth (Canada): Consider national figures and potential for faster growth in rural areas with improved charging infrastructure.

Market Growth:

Aligned with national EV adoption trends, with potential for faster growth in underserved regions once infrastructure expands.

Revenue Potential (Example):

P2P Service Fee: 10% commission on a \$10 charging transaction = \$1 per transaction

Let us assume 10,000 monthly P2P transactions in the next 5 years (conservative) = \$10,000/month x 12 months = \$120,000 annually

Through our Dedicated Network Station User Fee: \$5 per charging session

Let us assume 5,000 monthly charging sessions in the next 5 years (conservative) = \$5/session x 5,000 sessions/month x 12 months = \$300,000 annually

Single-Phase Charger Sales (Optional): Revenue depends on sales volume and pricing strategy.

Solution 2: PoleVault - Charge with Lightning Speed!

Solution Description:

Functionality:

Lamp Post charging typically works by retrofitting the existing streetlights or lamp posts with charging equipment where the lamp post construction is modified to accommodate charging devices, such as a plug or socket. To charge the EV's they are parked close to the charger and plug in the cable to the outlet which is connected to the local power grid from which they draw the power.

Key features:

The Key Features of the Lamp Post EV Chargers are using already-existing infrastructure, integrating it into power grids affordably, allowing for quick installation or removal, having minimal startup, and running costs, are well-suited to areas with long dwell times or overnight charging.

Target Application: The lamp Post EV charging could be used at any Workplace at the housing or any public parking spot.

Technical Specifications of Lamp Post Charger CHELSEA:

- Charging capacity: Standard max. 5kW (single-phase, 25 A)
- Rated voltage: 230V
- Charging mode: Mode 3 per BS EN IEC 6185 1-1 :2019
- Communication protocols: OCPP v1.6 Core + communication protocol, Firmware over-the-air updates
- Housing: Suitable for poles with an inner diameter of > 110 mm in the base and > 67 mm in the column
- Protection Technology: Residual direct current detecting device (RDC-DD) >6mA DC integrated Upstream components for electrical protection (fuse, RCD Type A) delivered as part of the installation standards and certifications: BS EN IEC 61851-1:2019
- UKCA / CE Marked
- UK Radio Equipment Regulations 2017 (as amended)
- UK Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 (as amended)
- EU Radio Equipment Directive 2014/53/EU
- EU Restriction of Hazardous Substances Directive 2015/863
- Alternative Fuels Infrastructure Regulations 2017 compliant
- ELEXON certified BSCP520 Measured Central Management System
- OZEV On-street Residential Charging Scheme (ORCS) compliant
- National Cyber Security Centre-certified

Market Needs

Accessibility of Charging Infrastructure

Utilize the current infrastructure, which is convenient and easily accessible by retrofitting the existing lampposts with charging outlets, facilitating EV owners' search for charging stations close to their residences or places of employment.

Urban Charging Availability

To increase the number of charging possibilities, lamppost chargers can be positioned throughout metropolitan streets helping reduce the range anxiety for the EV drivers.

Integration with Already-Existing Infrastructure:

Using the current lampposts reduces expenses and disturbance, thus enabling smooth interaction and installation by using the electrical grid already connected to the lampposts.

Wired and Intelligent Solutions:

Chargers can be outfitted with sensors, communication modules, and the ability to integrate with mobile applications through which the customers may reserve spots, check availability, and get notification improving the overall EV charging experience.

Residential Convenience:

Retrofitting lampposts in residential areas where EV owners reside resolves the issue of not having their own personal charging infrastructure, thereby encouraging renters and homeowners to buy EVs.

Encouraging Sustainable Transportation:

Lamppost chargers aid in sustainable mobility by promoting the usage of electric vehicles. They are in line with regional and national objectives for less reliance on fossil fuels and cleaner air.

Stakeholders

Municipalities and Local Governments:

Their main interest is towards supporting clean energy projects, improving urban infrastructure, and advancing green transportation ensuring that the proper regulations are followed.

Utility Companies:

They are responsible for supplying a steady flow of electricity by working together with owners of charging stations.

Charging Infrastructure Providers and Operators:

They set up and maintain the lamppost chargers, manage payment methods, user access whose primary focus is on generating income and encouraging the usage of EVs.

Property Managers and Owners:

Promoting environmental practices, drawing in renters, and raising the value of real estate by granting access and permits in the apartments or business spaces.

EV Owners and Users:

EV drivers depend on easily available and practical charging infrastructure which in turn decreases range anxiety, offering dependable and accessible charging choices, and encouraging environmentally responsible mobility.

Vehicle and Auto Manufacturers:

Manufacturers stand to gain financially from encouraging the use of EVs, giving their clients a flawless experience, by working with charging infrastructure suppliers thus increasing the number of charging stations, enhancing client happiness.

Impact on Stakeholders

Local Governments and Municipalities:

Local governments can enhance urban infrastructure and promote sustainable transportation thus reduced emissions, improved air quality, and increased EV adoption contribute to a greener city.

Utility Companies:

Increased demand on the electrical grid due to additional charging load providing opportunities for grid modernization and alignment with renewable energy goals.

Charging Infrastructure Providers and Operators:

Provide business opportunities and revenue generation by expanded charging network benefits EV users and supports cleaner transportation.

Property Owners and Managers:

Property value enhancement and community well-being by making them attractive amenities for tenants and residents.

EV Owners and Users:

Convenient and accessible charging options thus reducing range anxiety and increased EV adoption.

Automakers and EV Manufacturers:

Integration with existing EV ecosystems providing seamless experience for customers.

Solution 3: Watt's Next: Stop guessing, start charging!

AGGREGATION THROUGH PREDICTIVE MODELLING SERVICES

Solution Description:

Functionality:

We will be developing a predictive model to analyze data from existing public and private charging stations. Our aim over here is to predict potential maintenance needs and alert owners before malfunctions occur. We will also be providing maintenance and repair services for these charging stations.

We will also be creating an aggregated mobile app for EV owners as part of this product which will help them with:

1. Finding nearby charging stations based on location and availability.
2. See real-time information on station functionality and occupancy and an estimated wait time if all stations are engaged.
3. Provide them with estimated charging time-based on car battery and charger capacity.

We will also be developing a dedicated web and mobile app platform for charging station owners which will include:

1. Real-time station performance data (usage, energy output, revenue).
2. Predictive maintenance alerts and service recommendations.
3. Historical data analysis and reporting for informed decision-making.
4. Optional: Service scheduling and communication with maintenance providers.

Target Application:

1. Public and private charging station owners.
2. EV owners in Canada.

Technical Specifications:

1. Predictive model development using historical and real-time charging station data (e.g., temperature, power usage, error codes).
2. Integration with existing charging station communication protocols.
3. Mobile app with location services, real-time data display, and charging time estimation functionality.
4. Web and mobile app platform for station owners with data visualization, reporting, and service management features.

Market Need & Stakeholders:

Market Need:

We observed a big reliability issue when it comes to charging stations reliability. This can be a bigger issue when an EV user might be in immediate need of charging where every mile counts. We focus on overcoming this hurdle, improving the charging station reliability, and increasing their uptime.

We will enhance our user experience for EV owners through accurate information and convenience and help the charging station increase their revenue through charging and footfall both.

Stakeholders:

Charging Station Owners: Reduce downtime, minimize repair costs, improve customer satisfaction, experience increased footfall. Gain valuable insights into station performance and maintenance needs.

EV Owners: Reliable access to functional charging stations, better planning for charging stops, one stop solution.

Government: Promote EV adoption through reliable infrastructure and data-driven policy decisions, better monitor and regulate the schemes.

Impact on Stakeholders:

Charging Station Owners:

1. Increased revenue by reducing downtime and attracting more customers.
2. Improved operational efficiency through data-driven insights.
3. Potential cost savings with proactive maintenance.

EV Owners:

1. Reduced anxiety about finding a working charger.
2. Improved charging planning.

Government:

1. Improved public perception of EV infrastructure.
2. Access to data for policy development.

Market opportunity

Market Size:

Existing Public Charging Stations: ~26,500 ports and assumption that each station has 2 ports = ~13,250 stations. Even with conservative EV growth the projected EV stations in Canada in next 5 years would be around ~56,069 stations.

Market Growth: Tied to overall EV market growth and increasing demand for reliable charging infrastructure.

Revenue Potential (Example):

Predictive Maintenance Subscription: \$100/month per station

Assume we get about 1,000 subscribed stations in next 5 years =
\$100/month x 1,000 stations x 12 months = \$1,200,000 annually

Maintenance & Repair Services: Revenue depends on service volume and pricing.

App Transaction Fee: 2% commission on a \$10 charging transaction = \$0.20 per transaction

Assume we reach 100,000 monthly app transactions in next 5 years = \$0.20/transaction x 1 million transactions/month x 12 months = \$2,400,00 annually

Data Insights & Advertising (Optional): Revenue depends on market demand and pricing strategy.

Appendix

440 Megatonnes. (2023, March). Canada's Growing Network of Electric Vehicle Charging Stations. <https://440megatonnes.ca/>

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