# 2026 Targeted Call for Clean Energy Innovation

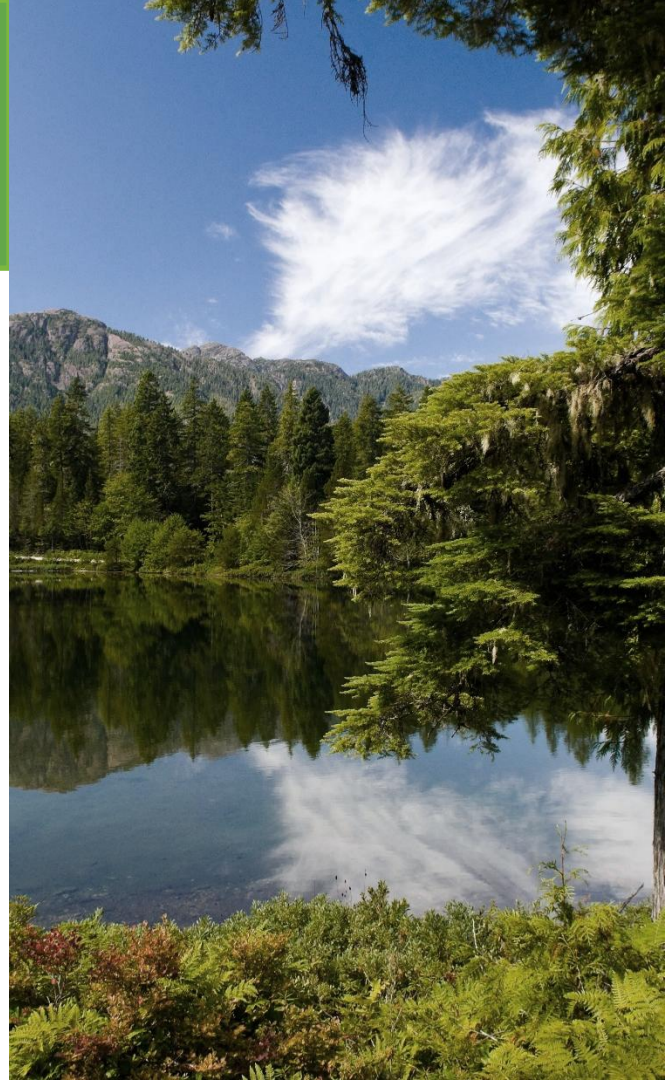
## (Populated Sample for Reference)

**The intended purpose of this sample application is to outline how each section can be answered. It is up to each applicant to convey their project as clearly and transparently as possible and ensure assumptions and calculations are documented.**

Instructions:

- Applicants must use this template and be no longer than 15 slides, minimum 12pt font.
- Blue text is instructional and can be deleted and replaced with applicant content.
- Include references and state assumptions where necessary throughout the application.
- Applications must be submitted in PDF format.

BRITISH COLUMBIA | Ministry of Energy and Climate Solutions



# Company Information

| Company Information | |
|---|---|
| Company Name | VEMS (Vehicle Energy Management Solutions) |
| Project Name | VEMS pilot deployment for residential and commercial application. |
| Headquarters | Victoria, BC |
| Contact Details | 1810 Blanshard Street, (250) 455 – 5555, ICEFUND@gov.bc.ca |
| In business since | March 2008 |
| Main product or service | Vehicle-Grid Integration (VGI) charging solution |
| Annual revenues (if applicable) | $100,000 |
| # of full-time employees | 15 |
| Owner/major investors | Jane Doe, CEO & Founder (65%)<br>Other Senior Employees (15%)<br>Private Investors (20%) |
| Private funds raised to date | $2.5M (private investors) |
| Government funds raised to date (indicate federal/provincial/municipal, and which programs) | $1M (NRCan) |
| Website | ICE Fund |

*VEMS*

*VEMS has proprietary technology that has the potential to create more convenient, efficient and cost-effective vehicle-grid integration (VGI) products for residential and commercial applications.*

# **Project:** Overview

| Description | Content |
|---|---|
| Project start date (Projects are required to start before December 31, 2026. Costs incurred before contract signing are ineligible.) | November 1, 2026 |
| Project end date (projects should be completed within two (2) years of contract start date. Project longer than 2 years may be accepted but proponents are recommended to contact icefund@gov.bc.ca for guidance.) | May 31, 2028 |
| Demonstration site(s) | First Nation Maintenance Facility, Northern BC |
| Overall project objective | Test and validate **ICEBOX™** charging solution, collect efficiency data for commercial deployment. |
| Technology Readiness Level at the start of the project | TRL 7, the prototype **ICEBOX™** charging solution is ready to test and validate in a pilot deployment. |
| Technology Readiness Level anticipated at the end of the project | TRL 9, at the end of the project the **ICEBOX™** charging solution will be tested and validated in a real-world demonstration and ready for commercial deployment. |
| Partners Involved | First Nation<br>BC Hydro |
| Estimated project costs | $2,000,000 |
| Request from ICE Fund | $850,000 |
| Other funding sources (include funding source name and funding status (proposed; applied for; confirmed; received). | $125,000 (IP Assistance from NRC IRAP) |

# **Technology:** Overview

Description: VEMS' vehicle to grid charging solution has the potential to be more convenient, efficient and cost-effective than traditional charging systems that cannot feed back into the grid. This project will allow us to develop a pilot demonstration that will act as the first-of-kind deployment through a partnership with a First Nation in northern British Columbia. Once the project is complete, VEMS will have a commercially available product with validated performance and efficiency data. The technical performance of the **ICEBOX™** charging solution and software has been validated in laboratory environment by 3rd party lab, XYZ Laboratories.

The Problem: VGI technology is not readily available for commercial or residential use. VEMS' VGI product has the potential to be affordable for commercial and residential users and is on the path to be compliant with utility and regulatory requirements in BC. This technology is anticipated to have a significant impact on load management across BC and the globe.

Theme Alignment: VEMS aligns with the priority theme "Utility Energy Management and Smart Grids". VEMS' VGI technology will support utilities with peak demand periods and capacity constraints on the grid, it will provide opportunities for customers to save on energy costs.

Technology Development post-project: Once this project is complete, the **ICEBOX™** will be validated with a real-world demonstration and will be ready for its first commercial customers (TRL 9). VEMS will still look at options to pilot the technology in different building types (i.e. condo buildings, industrial buildings, etc.) and with different vehicle classes and models.

# **Technology:** Innovation and Intellectual Property

The key innovation is broken up into two technology developments that have proprietary elements:

1. VEMS' **ICEBOX™** charging solution is a cost-effective and low maintenance product that allows bi-directional charging based on customer preference and grid demand cycles. The **ICEBOX™** charging solution has a faster charging speed and lower cost which out-performs similar technologies on the market.
2. VEMS' software application allows users to optimize their preferences and has the potential to choose the most cost-effective charging options based on utility pricing.

| Intellectual Property Questions | Description |
|---|---|
| What types of IP strategy or rights will you be relying on, and how will the protection be maintained post-project? | We have a license trademark for the **ICEBOX™** charging solution and a patent pending in US and Canada for the bi-directional charging component. We will continue to evaluate IP protection in new areas of business. |
| Who is the owner of the project IP? If IP is not owned by the applicant, what terms are in place to ensure you have secured IP rights? | All IP is owned by VEMS |
| What type of IP exists and which parts of the technology are covered? | Primarily trademark and patents for the brand and technology. IP will also be generated during the pilot project that will be used by VEMS and BC Hydro for future BC deployments. |
| What is your IP strategy to maintain a competitive advantage, and how does it align with your business strategy? | Our patent for the core technology and our software system will allow us to gain a significant competitive advantage through data collection with utilities, making it increasingly difficult to deliver a product at the same price and value. |
| What is your budget for IP? Have you been supported by any IP programs? | Our annual budget is $50k for IP, primarily supporting the patent process. We have been supported by one provincial and one federal IP assist programs. |
| Will IP be based in BC during and post-project? | IP is based in Victoria and will continue to be owned by VEMS in BC post-project. |

# **Energy, Cost and Environmental Benefits:** Description and Calculation

The primary energy benefit of the VEMS is grid management. Our VGI product will allow utility companies to manage the grid more efficiently by reducing use of grid electricity at times of peak grid demand. Benefits of the technology include "peak shaving" in specific geographic areas of the electricity grid and grid stabilization (e.g. energy storage; dispatchable distributed vehicle-to-grid charging) capabilities to manage variability in grid power demand. Based on extensive modelling and proprietary hardware this solution offers greater demand response benefits per event, for more times in the year, than competing technologies.

Emission Reduction: GHG reductions will depend on how clean the energy source is. BC benefits from an abundance of clean hydroelectric energy, however managing the grid efficiently reduces the need for supplementary energy sources or energy imports that may have higher GHG emissions.

Energy and environmental benefits calculations:

- Consistent with independent research*, with 10% commercial/residential uptake of this technology, peak electricity demand could be reduced by 6-10% at an electricity substation. Utilities value avoided peak capacity at $50 to $300 per KW-year so the economic benefits of the technology vary significantly by jurisdiction but assuming 300 demand response events a year at 3h duration each and 5kW of energy to grid per **ICEBOX™** this equates to 4500kWh/yr. Assuming $0.20/kWh for demand response utility programs this equals revenue of $900/year.
- The demand response economic benefits are only one part of **ICEBOX™** value since there are additional economic benefits provided resulting from the proprietary time-of-day charging which optimizes charging times where time-of-use in the day electricity rates apply.
- GHG emissions reduction benefits are based off the type of electricity generation. In BC, the amount of GHGs avoided is calculated using Electricity emission intensity factors for grid-connected entities - Province of British Columbia (gov.bc.ca).
- For forecasting purposes, one unit of measure is one **ICEBOX™** charging system deployed which is estimated to provide 5kW of peak shaving services and $900/yr in utility payment revenue.

**Independent Resource Source Name, Author, Date. Available: Website*

# Energy, Cost and Environmental Benefits: Impact

| | Per Unit of Technology | At Project Completion | 2030 Forecast (Annually and Cumulative) | 2040 Forecast (Annually and Cumulative) |
|---|---|---|---|---|
| Projected Unit Sales | | 20 | 300 | 3870 |
| BC Energy Savings (Gigajoule) | *4500 kWh or 16.2GJ* | 324 GJ[1] | 4860 GJ annually<br>6480 GJ cumulative | 63,000 GJ annually<br>322,000 GJ cumulative |
| Global Energy Savings (Gigajoule) | | N/A | N/A | 189,000 GJ annually<br>966,000 GJ cumulative |
| BC GHG Reduction (tCO2e) | *0.05* tCO2e | 1 tCO2e [2] | 15.5 tCO2e annually<br>20.7 tCO2e cumulative | 200 tCO2e annually<br>1027 tCO2e cumulative |
| Global GHG Reduction (tCO2e) | | N/A | N/A | 600 tCO2e annually<br>3081 tCO2e cumulative |

Assumptions: Approximately 20% annual growth rate in unit deployments 2030-2040 across Canada and North America. VEMS is in discussion with utilities in each of those regions and we have confirmed interest for this level of deployment by 2040.

This reduced peak electricity demand avoids the need to dispatch or procure supplementary electricity which can have a higher GHG intensity. In addition, the units in aggregate have the potential to reduce peak demand and avoid/delay incremental utility investments in the electricity grid. As part of this project, VEMS will work with BC Hydro to develop scenarios and estimates of wider energy and GHG savings.

[1] Assuming 25kW system is used at peak demand periods (5-8 pm) for 300 days/year. (5kW x 3 hours x 300 = 4,500kWh, converted to 16.2GJ)

[2] Source: https://choose.bchydro.com/why-choose-bc/clean-energy#:~:text=We%20are%20one%20of%20the,carbon%20dioxide%20equivalent%20(CO2e).

# Market and Value Proposition in British Columbia

| Market and Value Proposition | Description |
|---|---|
| Value proposition to end-users (max two sentences). | Our VGI product provides customers the opportunity to experience energy savings by managing supply and demand. The technology allows customers to feed electricity back into the grid for energy rebates while consuming electricity during non-peak hours when electricity is cheaper. |
| Competitiveness with existing commercial technologies/processes (how is the technology better than existing technologies and emerging competitors?). | Our innovative technology is cheaper than any commercially available technology, can charge more efficiently and offers customers the flexibility to manage their VGI technology through intuitive software. |
| Market size and market value associated with the technology. | Our market size correlates to the number of EVs on the road, which continue to grow exponentially. The biggest hurdle is the upfront purchase of our equipment to replace traditional charging systems. Our technology allows us to retrofit most existing equipment for a reduced cost. We are in active discussions with BC Hydro to create rebates for installations and retrofits. |
| Commercialization plan and expected pathway for commercial deployment and market adoption in BC and Canada (with priority in BC). | We have been in active discussions with utility companies and EV Original Equipment Manufacturers (OEMs) in North America as our primary commercialization strategy. We have several partners interested in deploying commercially pending a successful pilot project. |
| Potential for economic development and job growth in BC and Canada from this project and the commercialization plan. | We anticipate to create 80 full time employees (FTEs) within the first 5 years of commercialization. Every 10,000 units of increased capacity will result in approximately 40 FTEs. We have plans to open a commercial manufacturing plant in the Okanagan region, which will create economic development and employment growth in the region. |

| Estimation | At Project Completion | Forecast to 2030 | Forecast to 2040 |
|---|---|---|---|
| Job Creation in BC (FTE) | 5 FTE | 30 FTE | 85 FTE |

# Competitor Analysis

| Company | Core Technology | Performance Comparison | Cost Comparison | Key Company Strengths |
|---|---|---|---|---|
| VEMS | VGI charging solution | 200kW charger, bi-directional capabilities in development | $100,000 per unit | Key partnerships with First Nations and Utilities in BC. Able to retrofit existing chargers. |
| BC Fast Chargers Inc | Fast Chargers | 150kW charger, no bi-directional capabilities | $175,000 per unit | Largest fast charger supplier in BC and Canada, strong brand recognition. |
| OEM Fast Charger Ltd. | Fast Charger | 150kW charger, bi-directional capabilities in development but not commercially available. | $165,000 per unit | Brand recognition with leading EV brand. |
| VGI Technology Inc. | VGI charging solution | 150kW charger with VGI capabilities. Currently piloting technology in California. | $200,000 per unit | Strong partnership with utility in California. |
| VGI Software Inc. | Software for customers and utilities using VGI charging stations. | Compatible with VGI chargers. Developing software in partnership with Quebec utility. | ~$20,000 per unit | Company wants to create a system that can integrate with any bi-directional charger, software solution only. |

# **Project:** Workplan

Key milestones, duration and key objectives to achieve during milestone:

| Milestone Activity | Duration (months) | Key Objective to Achieve | Potential Risks | Cost per Milestone |
|---|---|---|---|---|
| Technology development | November 2026–April 2027 (6 months) | Build out the pilot product for installation. | Long lead time of equipment – mitigated through multiple vendor relationships. | $1,000,000 |
| Installation | May 2027 (1 month) | Install and synchronize software. | Connectivity issues at the inception of the project that may affect data. | $550,000 |
| Monitor technology and optimize efficiency | June 2027 – May 2028 (12 months) | Optimize efficiency and gather data for an entire year. | Any issues in software as it's the pilot demonstration would affect data results. | $350,000 |
| Final Report | May 2028 (1 month) | Develop efficiency and grid management report with the aim of sharing results to utilities and EV OEMs to prepare for commercialization. | Not having a full year of data results to share. | $100,000 |

# **Project:** Partners

| Partner Organization | Role in Project | Sector (e.g. Private, Public, Academia, or NGO) | Relationship Status (Confirmed, Developing, Applying) | Estimated Funding Amount (Cash) | Estimated Funding Amount (in Kind) | Status of Financing (Confirmed, Developing, Applying) |
|---|---|---|---|---|---|---|
| VEMS | Lead in the project, will build and monitor technology | | Confirmed | $175,000 | | Confirmed |
| First Nation | First-of-kind deployment partner, host of demonstration | | Confirmed | | $50,000 | Confirmed |
| BC Hydro | Providing grid installation support and utility data | | Developing | | $150,000 | Developing |
| Private Investors | Angel Investors | Private | Confirmed | $650,000 | | Confirmed |
| ICE Fund | Proposed Investor | BC Government | Applying | $850,000 | | Applying |
| NRC-IRAP | IP Assistance | Federal Government | Confirmed | $125,000 | | Confirmed |
| Total | | | | $1,800,000 | $200,000 | |

# **Project:** Management Team

| Name | Title | Relevant Experience |
|---|---|---|
| Jane Doe | CEO, VEMS | Jane has a Master's in Electrical Engineering. Prior to starting VEMS, Jane was a senior executive for over 20 years in the energy sector in BC. |
| Kiran Singh | CTO, VEMS | As the technical lead of the company. Kiran has a PHD in electrical engineering from UBC. The focus of their research was on bi-directional charging. |
| Jerome Smith | Software Lead, VEMS | A computer scientist by trade, Jerome has worked with multiple startups developing software applications. |
| Kurt Garcia | External Advisor, Scale-up Consulting | A senior advisor helping to scale up the business. Kurt has over successful ran Scale-up Consulting for over 25 years. |
| Alice Chan | Engineer, BC Hydro | Tracy is our primary partner at BC Hydro. She is assisting us with grid connectivity and gathering the relevant efficiency data. |

# Desirable Project Attributes

| Desirable Project Attribute | Description |
|---|---|
| Affordability | VEMS' VGI technology will increase affordability for residential customers by reducing energy consumption from the grid during peak times when energy is more expensive. With mass adoption, this could stabilize energy grids, creating the potential for cheaper energy supply. |
| Energy Resilience | With mass adoption of our VGI technology, grids will not surpass max capacity during peak times. Reducing the need for investments in infrastructure and new energy sources. This can provide energy resilience for areas that struggle with load management. |
| Equity, Diversity and Inclusion | Over 50% of our staff is comprised of under-represented groups. |
| Indigenous Benefit | Our partnership with a First Nation provides several benefits. The first-of-kind deployment allows members of the First Nation to see the benefits first-hand of this technology and how it can contribute to energy security and sovereignty. The location of the pilot demonstration is in a northern remote area of the province; this will give an opportunity for other rural and remote communities to see the benefits of this technology. We believe this technology has the potential to contribute to energy security in rural communities in addition to urban settings where grids are reaching capacity. |
| Regional Economic Benefit | The project will be demonstrated at a First Nation in Northern BC. Approximately 50% of project expenses will be spent in Northern BC, the other 50% will be spent in Victoria on technology development. |

# Additional Information (Optional)

- Our team has won BC Start-up of the Year in 2024 and 2025.
- We have an MOU in development with BC Hydro to pursue partnership opportunities.
- We have three potential industry customers interested in our product after commercialization. More details will be available in the detailed proposal stage.

**(Populated Sample for Reference)**

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