



Haida Nation Solar Array & Microgrid

Prepared by
Hedgehog Technologies

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PROJECT SUMMARY

Overview

Haida Gwaii, located off the coast of British Columbia, is an archipelago that serves as the home of the Haida Nation—an Indigenous group with a culture deeply rooted in the land and sea. Hedgehog Technologies partnered with the Haida Nation to design, build, and facilitate training for a 2 MW solar array and microgrid near the Masset airport.

The construction phase is completed and connects innovative technology with ancient cultural roots, empowering community members with essential skills for self-determination.

COMPLEXITY



The solar array is situated in an ecologically challenging region, surrounded by muskegs, pristine shorelines, and ancient old-growth forests. It is also home to rare and endangered species such as the goshawk, slender yoke-moss and Haida Gwaii slug. Its proximity to an operational airport added to these challenges but significantly mitigated the ecological impact.

Addressing these complexities required a groundbreaking partnership among three Indigenous communities: Skidegate, Masset, and the Council of Haida Nation. Obtaining regulatory approvals from stakeholders, including Transport Canada, Nav Canada, BC Hydro, the Municipality of Masset, BC Hydro, and the Province of British Columbia, was essential, requiring a change in land zoning.

Another challenging component involved managing logistical hurdles. Depending on the Prince Rupert Ferry Terminal for material deliveries required meticulous planning due to limited space and adverse weather conditions.

Successfully navigating environmental, regulatory, and logistical obstacles underscores the importance of strategic partnerships and careful planning when completing a solar project for a remote community. Real and meaningful stakeholder consultation played a critical role in the project's success.

MEETING CLIENT'S NEEDS



The development of the 2 MW solar array was a collaborative effort with the Haida Nation, specifically tailored to meet the community's unique needs. An unconventional contractor procurement process was employed that focused on long-term sustainability by emphasizing local training and employment mandates, beyond traditional factors such as cost and experience.

Contractors were assessed based on their commitment to training and capacity building. This approach guaranteed not only the project's successful completion but also played a key role in fostering the community's self-determination and long-term sustainability.

Establishing a flexible work schedule that aligned with major community events such as totem pole raising or funerals, demonstrated a deep respect for the cultural fabric of the Haida people. This approach nurtured a sense of ownership, integrating the solar farm into the community's identity.

The Haida Nation not only constructed a solar farm but also empowered themselves with knowledge and skills for maintenance and future expansion up to 4 MW. In collaboration with Hedgehog Technologies, this project transcends traditional construction methods, serving as a transformative force meeting the Haida Nation's needs for sustainability, self-determination, and cultural preservation.

INNOVATION (PART I)



OFF-GRID BATTERY STORAGE AND MICROGRID CONTROL

In collaboration with BC Hydro, Hedgehog Technologies designed a customized off-grid battery energy storage system for the solar array at Masset Airport to support the isolated network. This innovative system delivers a reliable and uninterrupted power supply, even in the absence of sunlight or during peak energy demand.

Named "Nimba," the off-grid battery energy storage control system integrates advanced lithium-ion battery technology with intelligent energy management algorithms. Nimba optimizes energy usage, reducing reliance on traditional power sources, resulting in a substantial decrease in greenhouse gas emissions and enhancing the airport's overall energy resilience.

INNOVATION (PART II)



TRAINING AND PROCUREMENT

Embracing a non-traditional approach to procurement that focuses on community and project sustainability, this initiative champions local hiring, particularly focusing on empowering the Haida people. By compelling contractors to engage Haida individuals, we sought approval from community chiefs and leadership, highlighting the potential risks involved.

Their resounding endorsement demonstrates a shift in traditional procurement towards one that prioritizes societal values. This strategy focused on sustainability, local training and employment over short-term cost considerations. In fact, when considering the entire product life cycle, taking a sustainable approach while ensuring local support is available is believed to lower the overall life cycle cost.

INNOVATION (PART III)



AIRPORT OPERATIONS AND REFLECTIVITY STUDY

One of the primary concerns of building a solar array at an active airport is the potential for glare that can affect landing planes all year round. To address this issue, Hedgehog Technologies conducted an extensive reflectivity study to analyze the reflective surface of different panel orientations and materials. They were able to determine the optimal positioning of the solar panels to minimize glare and ensure the safety of aircraft operations.

In order to implement a solar array at an active airport zoned for air traffic only, we encountered a host of challenges due to the strict Transport Canada regulations governing bodies. Airports are typically designated solely for aviation-related activities, and any deviation from this norm requires tremendous planning, careful code compliance, and coordination with regulatory bodies. Achieving this required significant effort, including training personnel, persuading transportation and navigation authorities, and adjusting land titles to comply with airport regulations to support a revenue-generating solar farm.

ENVIRONMENTAL BENEFITS

The Masset Airport solar array not only champions sustainable energy, but also prioritizes Haida Gwaii's native species, recognizing their integral role in the island's ecological fabric.

By strategically avoiding the clearance of 11 acres of old-growth forest and placing the solar farm on the cleared airport, the project safeguards habitats crucial for the Haida Gwaii slug, Sitka black-tailed deer, and Northern goshawks. These native species, essential to the island's biodiversity, contribute to its ecological balance.

Moreover, by displacing more than 600,000 liters of diesel fuel, the Masset Airport solar array will significantly curtail greenhouse gas emissions by over 33,000 Tonns of GHGs over the 20 year lifetime. This will be through mitigated air pollution, transportation of pollutants, and diminished dependence on non-renewable energy sources.

The environmental benefits achieved by the solar array at Masset Airport are not only significant locally, but also contribute to broader sustainability goals. By displacing diesel fuel and preserving old-growth forest, this project set an example for sustainable energy development.



SOCIAL ECONOMIC BENEFITS

With a focus on creating 100% Haida ownership through an energy corporation, operation, and economic activity, this initiative has fostered long-term economic sustainability. This has been possible by providing skills training opportunities, lowering the total product life cycle cost, and empowering the Haida people to move closer towards total energy sovereignty.

The solar array has acted as a catalyst for economic activity in the region. By providing job opportunities during the construction phase, and ongoing operation and maintenance, the project has stimulated the local economy.

The employment generated by the project has not only enhanced the livelihoods of community members but has also contributed to the overall economic prosperity of Haida Gwaii.

The emphasis on Haida ownership, operation, economic activity, and skills training has created a ripple effect in the community, fostering a sense of empowerment, self-sufficiency, and economic resilience. By actively involving the Haida people and recognizing their contributions, Hedgehog Technologies has set a precedent for socially responsible business practices, demonstrating the transformative potential of sustainable energy initiatives.





We thank you for your
continued support in our
efforts to build energy
resilient communities.

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