



## Renewable Energy Project Profile

### Hesquiaht First Nation Ah'ta'apq Creek Hydropower Project and Hot Springs Cove Community Solar Project

#### Project Context

Hesquiaht First Nation is the most northerly and the most remote of the Nuu-chah-nulth Nations in the Clayoquot Sound, situated on the west coast of Vancouver Island. In January 2000, Clayoquot Sound was designated for inclusion in the Network of UNESCO Biosphere Reserves, which includes portions of Hesquiaht First Nation territories. A diverse range of ecosystems exist within the biosphere reserve boundaries, including temperate coastal rainforest, ocean and rocky coastal shores.

Along with 13 other First Nations on the west coast of Vancouver Island, Hesquiaht First Nation are members of the Nuu-chah-nulth Tribal Council. Hot Springs Cove is Hesquiaht First Nation's most inhabited reserve with approximately 55 people residing in the community in 2021. This isolated village is not connected to the BC Hydro grid and, until recently, the village relied on diesel generators for all electricity.

Diesel fuel was barged annually to the Hot Springs Cove community through Clayoquot Sound, within the UNESCO Biosphere Reserve. The environmental cost of the diesel energy system included the emission of 627 tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) per year as well as a high risk of contamination during diesel transport and storage.

This case study focuses on two renewable energy projects developed in the village of Hot Springs Cove by Hesquiaht First Nation, with the goals of the community becoming self-reliant and eliminating mass fuel transport in the region.

The first project completed by the Hesquiaht First Nation in the fall of 2021 was the 350kW run-of-river Ah'ta'apq Creek Hydropower Project (the "hydro project"), designed to displace an average of 75% of the community's diesel-generated electricity, resulting in a GHG emissions reduction of 470 tonnes of CO<sub>2</sub>e annually. To complement the hydro project and further reduce their diesel dependence, the Hesquiaht First Nation also developed the Hesquiaht Community Solar Project (the "solar project"), a 133kW solar photovoltaic (PV) installation on the rooftop of the Hesquiaht Community School. The solar PV project further reduces GHG emissions by 91.3 tonnes of CO<sub>2</sub>e per year, for a total reduction of 561 tonnes of CO<sub>2</sub>e per year (89%). Over the lifetimes of these projects, the community will cut an approximate 20,000 tonnes of CO<sub>2</sub>e emissions in total.



Ah'ta'apq view from above  
Credit: Barkley Project Group



Ah'ta'apq Powerhouse Construction  
Credit: Barkley Project Group

#### Hydro Project Funders

New Relationship Trust – BC  
Indigenous Clean Energy Initiative

BC Ministry of Indigenous Relations  
and Reconciliation - First Nations  
Clean Energy Business Fund

BC Ministry of Forests, Lands,  
Natural Resource Operations and  
Rural Development - Rural Dividend  
Program

Natural Resources Canada (NRCan) -  
Clean Energy for Rural and Remote  
Communities

BC Ministry of Municipal Affairs and  
Housing - Investing in Canada  
Infrastructure Program: Rural and  
Northern Communities

CleanBC Renewable Energy for  
Remote Communities - Administered  
by the Fraser Basin Council

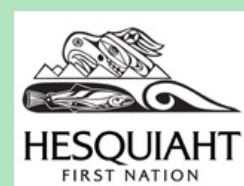
#### Additional Partners

Hesquiaht First Nation

Indigenous Services Canada

BC Community Energy Leadership  
Program

University of Victoria



## Solar Project Funders

New Relationship Trust - BC  
Indigenous Clean Energy Initiative

CleanBC Renewable Energy for  
Remote Communities - Administered  
by the Fraser Basin Council

## Additional Partners

Hesquiaht First Nation

## Project Lead

Norma Guerin-Bird  
Executive Manager, Hesquiaht First  
Nation

## Project Manager

Barkley Project Group

## Quote by Chief Joshua Charleson

*"Ever since I can remember there have been barges of diesel that have had to come up to Hot Springs Cove. It's always dangerous transporting anything by water, especially during winter. This is really good for the whole region – for the sensitive ecosystem in Clayoquot Sound."*

Hot Springs Cove Community Solar Project  
Credit: Barkley Project Group



These projects demonstrate sustainable resource development within Hesquiaht traditional territory, and they move the Nation towards an energy system that reflects their cultural teachings as stewards of the land. Increased economic opportunity will directly support the retention of Hesquiaht members, particularly youth, within the community. The Project repositions the isolated community as a technical leader, providing nation-building opportunities and inspiration for its youth.

## Project Description

As of November 2021, Hot Springs Cove is powered by their integrated 350kW hydro and 133kW solar PV hybrid system, built specifically to the needs of the community. The optimized hybrid system logs data during operations and maximizes diesel fuel reduction. The hybrid system only uses diesel powered generators for back up purposes. Both projects are 100% Hesquiaht First Nation owned.

Prior to switching to hydro and solar power, the Nation spent approximately \$600,000 on diesel fuel per year. This hydro project saves approximately 700 litres of diesel per day and the solar project saves an additional approximate 93 litres of diesel per day. In the first year of use, clean hydroelectric power has already saved Hot Springs Cove \$375,000 in diesel bills alone. As a result of these savings diesel supply can occur less frequently, reducing greenhouse gas emissions and the risk of spills. In addition, together the two projects have significantly reduced noise pollution within the community.

During construction, these projects created 4 full-time and 17 part-time jobs which were filled by Hesquiaht First Nation members. Two of the part-time environmental monitors received hands-on training from the full-time environmental monitor, also a member of the Nation. With experience gained working on the hydro project, both environmental monitors continued working on projects with Central Westcoast Forest Society in Hesquiaht traditional territory.

Four local community members are now employed as permanent part-time operators at the Ah'ta'apq Creek Hydropower Project. Maintaining the solar project is also a component of the four operator jobs. These operators will ensure that the solar PV system production is functioning as expected and confirm proper integration of the PV system with other energy systems. Remote monitoring infrastructure will allow operators to share the live production statistics from the solar PV system with the community.

Hesquiaht First Nation is a participant in the Joint Nation Off-Grid Energy Training Program. Through this program, the Hesquiaht First Nation will share knowledge and lessons learned during the development, construction and operation of the Project with other First Nations in remote coastal locations in BC.

Data will be continuously collected to optimize generation from the solar PV system and operations of the Hot Springs Cove hybrid microgrid. These data and knowledge from the operation of this system will be invaluable for other BC First Nations performing community solar installations and will be especially helpful for remote communities pursuing diesel reduction through renewable energy systems.

Ah'ta'apq Headpond  
Credit: Barkley Project Group







## Project Benefits

These projects have increased community self-sufficiency and resilience through minimized dependence on delivered diesel fuel. Hesquiaht First Nation is now able to reduce the number and frequency of diesel deliveries to Hot Springs Cove. This minimizes community susceptibility to diesel fuel availability, diesel fuel costs, and infrastructure damage caused by increased storm surges and flooding events.

There is not only a reduction in the number of barge fuel runs through the UNESCO Biosphere Reserve, but also a reduction in fuel truck deliveries from the barge to the storage tanks approximately 2 km down rough forest service roads.

The annual savings from diesel operating costs will provide direct social benefits to the Hot Springs Cove village, as the funds can be reallocated to other programs, activities, and infrastructure projects. In addition, the investment in the community from the Project will also create incentives for off-reserve members to return home.

## Lessons Learned

1. A proactive and creative approach to local employment was required to ensure opportunities for both direct and indirect employment (and related training) were available for community members, especially during the COVID-19 pandemic.
2. Diligence in terms of COVID-19 risk mitigation measures, and closely adhering to provincial and federal regulations and guidelines based on changing conditions, was critical for the overall safety of the project team members and the nearby community. Measures taken included separate living and eating quarters for crew, face masks, hand sanitization, as much physical distancing as feasible, and clear separation from the community.
3. Building a project schedule with adequate float, which allowed for unknown ground conditions and seasonal constraints (e.g., reduced earth work during heavy rains, reduced concrete work in sub-zero weather) was important for setting realistic expectations.
4. It was important not to underestimate the challenges and unpredictability of barging materials to the remote site, which was required for all material and equipment delivery. Success of the project required consulting with local barging operators; understanding weather and tide-related access restrictions of the site; and preparing for the possibility that barges could be unavailable or unpredictable at times during poor weather.
5. Regular reporting to stakeholders (including funders, owners, community member and local landowners) was critical for overall project communication.

## References

BC Ministry of Energy, Mines & Petroleum Resources (June 18, 2020), Province supporting Hesquiaht First Nation transition to clean energy  
<https://news.gov.bc.ca/releases/2020EMPR0021-001090>

Hesquiaht First Nation (2022), Our Story  
<https://www.hesquiaht.ca/pages/our-story>

UNESCO (2018), Clayoquot Sound Biosphere Reserve, Canada  
<https://en.unesco.org/biosphere/eu-na/clayoquot-sound>

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## Hydro Project Milestones

### 2013

Pre-feasibility Phase: Hydrometric program in place to prove resource availability.

### 2014 - 2015

Feasibility Assessment Phase: Geotechnical investigation, permit applications and preliminary civil engineering began in 2014. The project was proven viable.

### 2016 - 2017

Design Phase: Activities included seismic surveys; inundation analyses; economic analysis; geotechnical, civil and electrical engineering design; road design and permitting.

### 2018

Construction Phase 1: Site access construction and initial ground investigation were completed.

### May 2020

Tendering and Procurement Phase

### September 2020 - September 2021

Full Construction Phase: Construction of the intake, tributary intake system, penstock, powerhouse and distribution line.

### November 2021

The hydropower plant was commissioned.

## Solar Project Milestones

### November 2020

Community engagement

### April 2021

Solar PV system design

### June 2021

Procurement & high voltage extension regulatory process

### August 2021

System installation

### September 2021

High voltage system installation

### November 2021

System interconnection and integration with hydro project

PROGRAM ADMINISTERED BY:

