# Renewable Energy Project Profile Xeni Gwet'in Community Electrification (Underground Distribution)

# **Community Context**



Xeni Gwet'in First Nation is one of six communities that form the Tŝilhqot'in Nation. The name Tŝilhqot'in carries varied meanings and loosely translates to "people of the river" or "people of the blue water." The spirit of the Xeni Gwet'in has been shaped by the rugged landscape of Tŝilhqot'in territory since time immemorial.

The community of Xeni Gwet'in is in the heart of British Columbia, the Nemiah Valley. The Nemiah Valley is one of the most beautiful areas within the Cariboo Chilcotin, made up of glacially sourced waterways, mountain terrain, untouched forest and unique ecosystems. Located in traditional Tŝilhqot'in territory approximately 200 km west of Williams Lake, this remote location can only be accessed by driving 100 km on an unpaved gravel road.

Xeni Gwet'in includes approximately 400 descendants of ancestors who have been here since time immemorial. Roughly 150 of these descendants reside within the territories. The people in Xeni Gwet'in have always managed, adapted with, utilized and maintained their land and unique governance systems. On June 26, 2014, they won a historic Supreme Court of Canada case on Aboriginal Title and Rights covering a portion of the territory.

Xeni Gwet'in is an off-grid community with an existing micro-grid system that is currently powered by a hybrid diesel generator set, 250 kW photovoltaic (PV) solar array, and 1 MW lithium-ion battery storage system. However, the micro-grid system is limited by its distribution infrastructure and therefore is unable to service the entire community of Xeni Gwet'in, which consists of three sub-communities. The Xeni Gwet'in Community Electrification (Underground Distribution) Project (the "Project") ties 27 additional houses into the grid. These households were previously powered by independent gas or diesel generators purchased and operated by homeowners.



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Doreen William-Grinder, left, Dalton Baptiste and former chief Roger William. Credit: Shannon Woods photo

### **Project Funders**

- Xeni Gwet'in First Nations
  Government
- New Relationship Trust BC Indigenous Clean Energy Initiative (BCICEI)
- Indigenous Services Canada (ISC)
- CleanBC Renewable Energy for Remote Communities (RERC) - administered by the Fraser Basin Council (FBC)
- NRCan Clean Energy for Rural and Remote Communities (CERRC)

# **Project Lead**

**Dalton Baptiste** First Nations Administrator, Xeni Gwet'in First Nations Government

# **Project Milestones**

**2014** Feasibility Studies

**2021** Community Engagement Directional Drilling

#### 2022

Construction Completed Project successfully commissioned

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### **Project Video**



Xeni Gwet'in Community Electrification <u>Project video</u> Credit: New Relationship Trust

### **Lessons Learned**

1. System design should consider the capacitance of underground cables, especially for small isolated communities with limited power sources.

2. It is crucial to find engineers with experience in dealing with specific design parameters, such as underground line capacitance, to ensure accurate modelling and appropriate system design.

### References

Xeni Gwet'in Nation (2023) https://www.xeni-gwetin.ca/

New Relationship Trust (2023) https://newrelationshiptrust.ca/



Shunt reactor 12 with open cover Credit: Xeni Gwet'in Nation



# **Project Description**

The Project involved installing a 14.4 kV underground distribution system 17 km in length between houses, and an additional 7.8 km of line to connect the central community to the West End community, including residential single-phase transformers.

To reflect the traditional lifestyles and values of community members, Xeni Gwet'in has elected to only allow the development of underground distribution lines in their community. Xeni Gwet'in are committed to preserving the integrity of the vast, pristine and remote landscape surrounding the community for current and future generations.

Underground distribution lines avoid marring the aesthetic attraction of the valley. This is an important consideration because of the community's plans to expand their tourism industry. In addition, underground distribution lines mitigate the risk of intense wind events and the increasing threat of wildfires to their community energy system.

The Project eliminated gas or diesel generator dependency for 29 homes. As a result, 50,000 litres of fossil fuels were displaced, leading to an estimated reduction of 135 tonnes carbon dioxide equivalent (CO2e) greenhouse gas emissions annually.

Connecting these homes reduced the financial stress of extremely high energy rates and eliminated energy inequality for the 29 long-time residents. The construction of the underground line was done by Xeni Gwet'in Enterprise, which helped support local skills and training development by providing employment opportunities for 15 Xeni Gwet'in members during the construction. With six more new houses being built, the completion of the electrical underground distribution system provided reliable and affordable electricity to a total of 35 homes.

The Project also created opportunities for more clean energy project expansion in the future, allowing for more skills training in the clean energy sector. The addition of the underground distribution line was a necessary step in allowing Xeni Gwet'in First Nations Government to reach its goal of being 100% powered by renewable energy and supported future community infrastructure growth.

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