

## CASE STUDY

# Klemtu School Solar Initiative



“This project is a landmark in achieving energy independence through environmentally sustainable forms of electricity generation”

DOUG NEASLOSS, CHIEF, KITASOO/XAI'XAIS FIRST NATION



## OVERVIEW

Klemtu, located on Swindle Island in the the Great Bear Rainforest, is a community that envisioned a solar initiative that would supplement the existing micro-grid sourced by diesel generators and a hydroelectric facility.

HAKAI Energy Solutions worked with the Kitasoo/Xai'Xais First Nation to design, install, and commission the 23 kW solar facility. The result was increased reliability, reduced risk of brown-outs, and an affordable and sustainable addition to the remote energy system. When isolated communities rely on diesel generation they face fuel price instability, high operating and maintenance costs, dependence on shipments, and reduced generator lifetimes due to continuous operation.

While Klemtu is fortunate to have hydroelectric generation on site, such production can compromise the community's access to freshwater ecosystems, particularly during years of low rainfall and drought. In 2015 the community experienced dry summer conditions which utilized the full capacity of Baron Lake, leaving the reservoir empty for two months. As a result, the community had limited drinking water and the diesel generators became the exclusive producer of energy.

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HAKAI Energy Solutions is dedicated to working with communities to develop energy systems that are sustainable and cost effective while providing reliable power year-round.

## SYSTEM SPECIFICATIONS

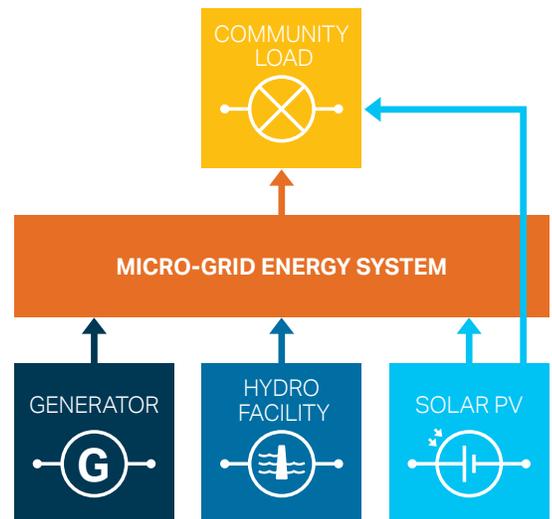
Location	Klemtu, Central Coast BC
Peak Capacity	23 kW
Commissioning Date	October 2015
System Type	Roof-mounted photovoltaic connected to hydroelectric and diesel micro-grid
Photovoltaics	100 x 230W polycrystalline
Inverters	4 x SB 6000TL-US

## SYSTEM PERFORMANCE HIGHLIGHTS

Annual photovoltaic energy generation <sup>1</sup>	23,565 kWh
Average annual energy yield (kWh/kWp)	1,025
Cost savings per kWh compared to diesel alternative <sup>2</sup>	\$0.65/kWh
Lifetime savings <sup>2</sup>	\$346,300
Payback period <sup>2</sup>	7.9 years
Lifetime reductions in CO2 emissions	403,200 kg

1 Annual generation calculated based on regional variables and equipment specifications.

2 Compared to \$0.91/kWh (BC Hydro 2014 CEP), including O&M, direct offset of diesel, performance depreciation of 0.7% per year, net present value with 2.5% discount rate.



The Kitasoo/Xai'Xais First Nation is now able to access photovoltaic renewable energy that is less expensive and more sustainable than other components of their existing micro-grid. With a payback period of 7.9 years and a minimum lifetime of 25 years, the community savings will exceed \$346,300<sup>2</sup>.

Solar PV has proven to be more cost effective compared to alternative diesel-fueled generation. With the high costs of fuel, operation, and maintenance associated with diesel generation the community saves \$0.65 per kWh generated by the photovoltaic system<sup>2</sup>.

In summers when water reservoirs are low due to drought or low winter snow pack, the Kitasoo/Xai'Xais Nation is able to rely less heavily on limited freshwater from Baron Lake for hydroelectric energy generation. These resources can instead be allocated for residential use in the growing community or to support the ecosystems surrounding Klemtu.