T'Sou-ke Trainees completing 40kW Photovoltaic System.

Jessica Bekker, University of Victoria Engineering Co-op student in front of 40kW and 22kW photovoltaic systems.

Model 3:
Selling Surplus Clean Energy to BC Hydro- 62kW Array

This system shown in Model 3 produces 62 kW of clean energy which is available to the community or for sale to BC Hydro. This system truly embodies the potential for First Nation communities' on and off grid to have more control and ownership of their power production. On such a large scale there are greater benefits to the environment such as a significant reduction in Green House Gases by measurable tonnes.

Advantages: Quiet, environmentally friendly, Self-Autonomous power production, and very low maintenance.

Disadvantages: Start-up costs and intermittent production depending on sunshine.

Lessons Learned: to be cost effective needs financial support structures within BC Hydro to acknowledge cost of producing clean energy which replaces coal and oil fired electricity generators supplying BC from Alberta

T'Sou-ke Nation
Photovoltaic Demonstration Project

Three Model Photovoltaic Systems

Typical Applications For 'ON' and 'Off' Grid First Nations in BC:

1. Autonomous System - Off the Hydro Grid - 6kW.
2. Emergency Battery Back-up and Net Zero System - 7kW
3. Selling Surplus Clean Energy to BC Hydro - Net Producer - 62kW Array.

Introduction to Photovoltaic Systems

Photo = Energy from the sunlight. **Voltaic** = Electricity

Photo+Voltaic = Electricity produced from the sunlight

Just as chlorophyll in the plants that provide food absorb and transfer sunlight (Photosynthesis), so does sunlight and silicon produce electrical power (Photovoltaics)

Photovoltaics produce clean energy and are ideal for replacing traditional forms of power production that produce Green House Gases (GHG) as harmful by products.

Also Photovoltaics along with other renewable energy sources may be ideal for remote communities that do not have access to the Hydro grid.

July 17th, 2009

Sponsored by B.C.'s ICE Fund
(Innovative Clean Energy Fund)

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Model 1:

Autonomous System – ideal for 'Off Grid' use.

The autonomous system shown in Model 1, is a building not connected to the Hydro grid and reliant upon solar power generation and some form of backup such as a diesel or propane generator or preferably another form of renewable energy. The solar power greatly reduces the need for diesel power throughout all hours of the day. During the sunlight hours the excess solar power is stored on batteries for use at night.

Advantages: Lowers diesel power use, quiet, healthier, environmentally friendly, self-autonomous power production, low maintenance.

Disadvantages: High start-up costs, batteries need maintenance and periodic replacement, and dependent on sunshine.

Lessons learned: This system could work well as a renewable energy hybrid if other renewable forms of energy available as well such as wind, run of river, geothermal or tidal. Also it is important to include conservation of energy measures before installation of power generation.

Model 2:

Emergency Battery Back-up and Net Zero System

This system shown in Model 2 uses solar power as an emergency battery back-up system in the case of a hydro power outage. This building is connected to the Hydro grid and can sell back excess solar power. By the end of the year the cost of power consumed is offset by the power sold back to the hydro potentially resulting in a hydro bill of $0 (Net Zero).

Advantages: Net Zero Hydro bill, Self-Autonomous power production, lower Green House Gases, can power emergency loads such as phones, computers, kitchen appliances, health supplies and freezers during a power outage.

Disadvantages: High start-up costs, and batteries need maintenance and periodic replacement.

Lessons Learned: Need to include extensive conservation measures to reduce solar panel costs.