Final Project Report

Report Prepared By:
Gordon Borgstrom, Project Manager
Dalyce Brandt, Project Coordinator

Funded by:

British Columbia
Ministry of Jobs, Tourism and Innovation
Pine Beetle Epidemic Response Branch

Southern Interior Beetle Action Coalition
SIBAC

Canada's Rural Partnership
Government of Canada / Gouvernement du Canada

Columbia Basin Trust
a legacy for the people

Cariboo Chilcotin Beetle Action Coalition

Omineca Beetle Action Coalition

1.) PURPOSE OF THE PROJECT

The purpose of this project was to undertake a series of activities that will help rural BC communities and First Nations affected by the Mountain Pine Beetle (MPB) epidemic, better understand the potential opportunities of Green Energy development and its potential contribution to rural economic development and diversification. For the purposes of this project, Green Energy is defined as any energy produced from a renewable resource.

The project was designed to work directly with a number of small rural communities in the interior of BC. Many rural communities in BC have expressed an interest in learning more about green energy development and in potentially developing their own Green energy project (e.g. a micro-hydro IPP). However, due to their small size and limited budgets many rural communities and First Nations require external financial assistance, resources and expertise to be able to identify and develop Green energy projects and business initiatives. Since so many rural communities and First Nations are interested in Green energy development, the information developed through this project will be widely shared with all communities in the Mountain Pine Beetle (MPB) epidemic zone and throughout BC.

2.) BACKGROUND TO THE CREATION OF THE PROJECT

The original concept for this project was developed collaboratively between the Pine Beetle Response Branch of the Ministry of Jobs, Tourism and Innovation (MJTI) and the three regional Beetle Action Coalitions (BACs) in the province.

The Cariboo-Chilcotin Beetle Action Coalition (CCBAC), the Omineca Beetle Action Coalition (OBAC), the Southern Interior Beetle Action Coalition (SIBAC) and MJTI all share a common goal of stimulating economic development and job creation in the MPB epidemic zone. The Province of BC has identified Green energy development and the creation of a Low Carbon Economy as top provincial priorities. The Province believes that both Green energy development and the creation of a Low Carbon Economy offer significant potential economic development opportunities to rural communities and regions including those in the MPB epidemic zone. Local governments and First Nations in the MPB epidemic zone are interested in exploring how Green energy projects can contribute to their environmental, economic and job creation objectives.

Several organizations such as the Ministry of Energy, Mines & Petroleum Resources; the Community Energy Association; the BC Bioenergy Network; BC Climate Change Exchange; Premier's Technology Council; Canadian Wind Energy Association; and others; have developed extensive material and resources for communities outlining the potential rural and community benefits of Green Energy development. However, these tools are often limited to specific types of Green Energy (e.g. wind, bioenergy) or are case studies of larger urban projects. Much smaller (i.e. less than 5000 population) rural communities usually lack the resources to fully understand the opportunities associated with green energy development. Policies sometimes inadvertently perpetuate this problem – for example, BC Hydro had a grant program to assist communities with one form of Green Energy feasibility

assessment – but only communities with 10,000 people or more were eligible. Similarly, green energy companies often focus on working with larger communities (since they have more capacity) and larger scale projects in order to satisfy project timelines and return-on-investment targets.

It is also clear that Green energy projects are likely to expand rapidly over the next five years and the majority of these projects will be located in rural BC. The question for many rural communities therefore is how can they benefit from development of the Green energy sector?

The BAC's had been introduced to the concept of linking Green energy and rural economic development by hearing the success of Scotland's Highlands and Islands Enterprise (HIE) at a 2008 rural economic revitalization conference supported by SIBAC. Highlands and Islands Enterprise (HIE) – a rural development agency in northern Scotland – has linked Green energy and rural economic development to the benefit of both rural communities and the Green energy sector. Much of the success of Highlands and Islands Enterprise's Green energy initiatives was their focus on working with small rural communities. HIE developed a consulting unit that helped small communities identify, develop and build green energy projects. HIE also worked with representatives of rural communities and the Green Energy sector to identify elements of the business supply chain that posed economic development opportunity for rural communities. This examination of the business supply chain benefitted both the rural communities (by identifying investment and economic development opportunities) and the Green Energy business sector (by increasing community support and facilitating the creation of required Green Energy support services and labour that the industry required).

Given the widespread community interest in Green energy development in BC, the partners decided that a project such as the Green Energy as a Rural Development Tool was very timely and relevant. The final project concept and deliverables were developed through an expanded project partnership that includes the Columbia Basin Trust and the Federal Government's Rural Secretariat.

3.) MAJOR COMPONENTS OF THE PROJECT

As noted above the major primary objectives of this project were twofold: (i) to develop information and tools that will assist rural communities in understanding and identifying Green energy opportunities; and (ii) to work directly with a number of rural communities in the MPB epidemic zone to help them further their proposed Green energy projects.

As a result, the project completed a wide range of initiatives and actions under five major project activity components:

(1) To create and circulate a variety of Green energy information resources and analysis tools to rural communities throughout the MPB epidemic zone.

(2) To work directly with three small rural communities to assist them in the

completion of their proposed Green energy developments.

(3) To provide Green energy consulting services to at least three additional rural communities and regions to assist them with Green energy project feasibility assessment.

(4) To work with Green energy industry development organizations and businesses to identify potential rural business and employment opportunities associated with the Green energy sector.

(5) To organize and deliver a series of regional outreach and knowledge extension activities throughout rural interior BC in order to ensure extensive circulation and understanding of the knowledge, material and tools developed as part of this project.

4.) PROJECT FUNDING PARTNERS

The funders for this project were:

- Federal Rural Secretariat –Agriculture and Agri-Food Canada ($175,811.51)
- The Pine Beetle Epidemic Response Branch of the Ministry of Jobs, Tourism and Innovation ($75,000)
- Columbia Basin Trust ($50,000)
- Cariboo-Chilcotin Beetle Action Coalition ($25,000)
- Omineca Beetle Action Coalition ($25,000)
- Southern Interior Beetle Action Coalition ($25,000),

5.) PROJECT MANAGEMENT

Early in the project concept development, the Southern Interior Beetle Action Coalition (SIBAC) agreed to be the lead managing partner for the project. As a result, all spending and contracting was done through SIBAC and was consistent with their policies and the funding agreements signed by SIBAC with each of the other funding partners. Through discussions with the funding partners it was agreed that Gordon Borgstrom of the Pine Beetle Response Branch would serve as overall Project Manager as an additional in-kind contribution to the project by the provincial government. Dalyce Brandt (Sharp Image Consulting) served as the Project Coordinator.

A Project Advisory Committee was formed to provide input and advice on the project during the project start-up. Members of the Project Advisory Committee were:

Rick Allen	Columbia Basin Trust – Environment Program Manager
Jack Allingham	Retired Utility Manager, District of Lake Country

Geoff Battersby	Revelstoke – key player in the Revelstoke District Heating System
Tom Dall	Chief Administrative Officer, Village of Valemount
Robert Duncan	Chief Executive Officer, Hupacasath First Nations, and CEO – Upnit Power Corporation
Rob Gay	SIBAC Director
Marc Imus	MPB Epidemic Response Team MJTI
Jack Richardson	Chief Administrative Officer, Village of Slocan
Ted Sheldon	Special Advisor, Climate Change Secretariat, Ministry of Environment
Bob Smith	OBAC Director
Gordon Borgstrom	Executive Director, MPB Epidemic Response Team MJTI
Dalyce Brandt	Project Coordinator for the Green Energy Project and SIBAC Administrator

Based on input from the Project Advisory Committee, final decisions on developing specific deliverables and selection of project consultants and service providers was made by a smaller Project Management Team comprised of Gordon Borgstrom, Marc Imus and Dalyce Brandt. Once the Project Management Team had agreed on project deliverables and the selection of project consultants; the Project Coordinator was responsible for developing contracts that were consistent with SIBAC policies and the combined expectations of the various project funders.

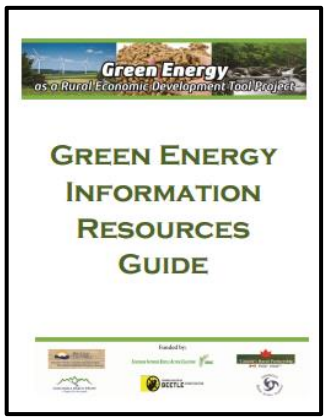
6.) PROJECT ACCOMPLISHMENTS & DELIVERABLES

The following provides a summary description of the completed projects.

A.) GREEN ENERGY INFORMATION AND TOOL DEVELOPMENT

The purpose of this major activity component of the project was to develop and circulate new information, tools and resources that will help communities and First Nations better understand the Green Energy sector and opportunities.

(i) Creation of a Green Energy Information Resources Guide



This document is a compilation of information and tools already publicly available that are relevant to this project. An Extensive and exhaustive web and literature review search was conducted to provide a resource that was useful and compete. This 20 page Resource Guide is posted on the project website.

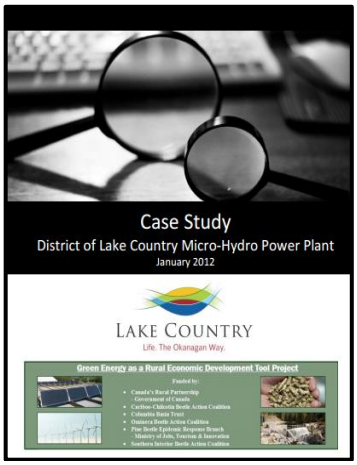
(ii)Development of a dedicated Project Website

Given the desire to share project information and tools as widely as possible it was decided that the development of a dedicated project website would be the most effective and efficient method to make project information and tools available. After a competitive Request For Proposals process, a consultant was selected to develop the project website. The project website was completed in May 2012. http://www.ruralbcgreenenergy.com/. All project materials are posted on the website. SIBAC will keep the website live till at least the end of 2017.

(iii) Creation of Detailed Green Energy Project Case Studies & Fact Sheets

Through discussions with community leaders, staff, project funders and the Project Advisory Committee it became clear that many different parties were interested in obtaining more detailed information on existing Green energy project success stories in BC. While several documents (i.e. some of the Community Energy Association manuals) provide very short project overview descriptions of some existing projects; there was no written information currently available that described in detail the creation, development process, cost/benefit analysis, financing arrangements and revenue details of these projects.

To fill this information gap the following case studies were completed:

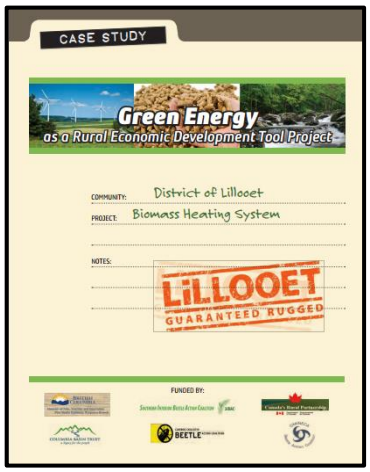


District of Lake Country Micro-Hydro Power Plant

Completed January 2012, the District of Lake Country micro-hydro power plant case study profiled in detail the power plant from concept to operation. The District of Lake Country's 1.1 megawatt micro-hydro plant became operational in June 2009 and produces enough power to supply approximately 400 homes. The 15 page Case Study report provides detailed information on the project development timelines, sources of financing and cost/benefit analysis of the project. The Case Study report also includes a 174 page Appendix packages that includes many of the key documents for the design and construction of the micro- hydro plant.

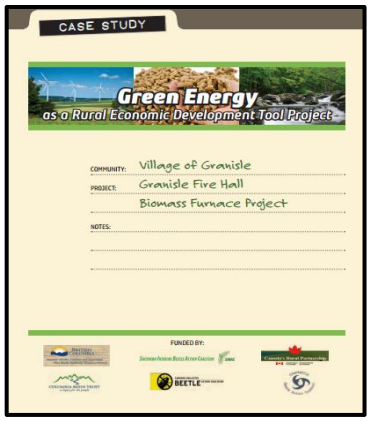
China Creek Micro-Hydro Power Plant

The second Case Study is a detailed report of the experiences of the Hupacasath First Nation in the development of their China Creek micro-hydro power plant and the Nation's experiences of exploration of other micro-hydro power developments in their traditional territory. The Hupacasath First Nation operates the 6.5 megawatt run-of-the river power plant on China Creek through their company Upnit Power. The Hupacasath First Nation is the majority shareholder of Upnit Power with Synex Energy Resources Ltd, Ucluelet First Nation and the City of Port Alberni. The Hupacasath Case Study report was completed November 2012.



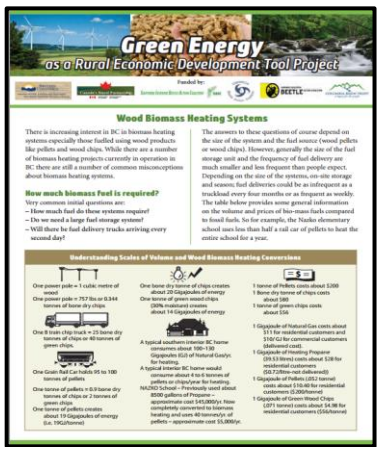
District of Lillooet Biomass Heating System

Completed in October 2012, the District of Lillooet Biomass Heating System is a Case Study that profiles the installation and cost of a new pellet boiler and building upgrades to the Lillooet Recreation Centre - that houses an arena, swimming pool and library. The project involved replacing one of the older used propane boilers with a new 400 kW KOB pellet boiler. The new boiler supplies 80-85% of the heat demand for the Recreation Centre. The new system has resulted in a savings of approximately $26,000.00 annually to the District of Lillooet.



Village of Granisle Fire Hall Biomass Furnace Project

The Village of Granisle is a small community with a population of 350. Completed in January 2013, the Village of Granisle Fire Hall Biomass Furnace Project is a Case Study that profiles the installation of a containerized wood chip boiler to heat their 200 m² fire hall. The new system has reduced energy costs by 50%, reduced the GHG emissions resulting in further savings of $400 and educated the community on the use of local energy sources.



Wood Biomass Fact Sheet

The project also developed a brief two page Fact Sheet that provides overview information on Wood Biomass heating systems. Based on the feedback received the Fact Sheet has proven to be a valuable reference piece for communities.

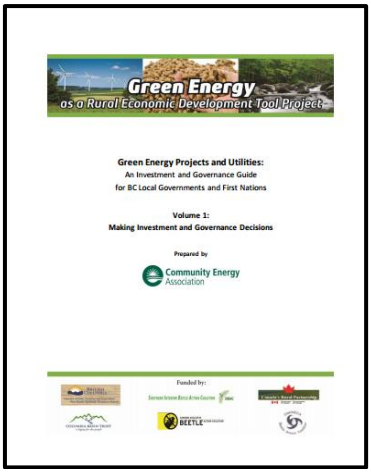
(iv)Creation of Videos on Existing Green Energy Projects

As noted the focus of this project is on providing resources to rural communities and First Nations throughout BC. Since these groups often have small staff complements and small budgets; we were looking for the most effective and efficient ways to effectively share information.

While the written case study reports will be helpful, often community leaders and staff would also like to be able to personally visit Green energy project locations. Since this isn't always possible or cost effective it was decided to create two videos as part of this project that visually profile a couple of existing Green energy projects in BC - the District of Lake Country and the Hupacasath First Nation – China Creek micro-hydro plants.

These videos are posted on the project website so that they can be viewed by people throughout BC (or the world) at any time. Creation of these videos has also helped the profiled communities - since they are frequently approached by external parties wishing to arrange on-site visits. After a competitive Request For Proposals process a video production firm was retained to create the videos. The District of Lake Country video was completed in June 2012 and China Creek was completed in January 2013.

(v) Creation of a Community & First Nations Guide on Investing in Green Energy Projects



The purpose of this Guide is to provide local governments and First Nations with detailed information on important considerations in developing and investing in Green Energy projects.

The Green Energy Projects and Utilities: An Investment and Governance Guide for Local Government and First Nations is in two volumes:

- Volume 1 Making Investment and Governance Decisions
- Volume 2 Case Studies in Financing Ownership

This guide is posted on the project website and serves as a valuable tool for organizations interested in pursuing a green energy project.

B.) WORKING WITH THREE "PILOT PROJECT" COMMUNITIES

As noted earlier, a key component of the project was to work with one community in each of the three BAC regions to further the development of a key Green energy project idea.

(i) Village of Slocan - Micro-hydro Power Development (SIBAC Region)

In the SIBAC region, the Village of Slocan was identified as the major pilot project community. For several years, the Village of Slocan has been exploring the feasibility of building a municipally-owned micro-hydro power plant on Springer Creek. As a very small village, this project is massive undertaking. Due to a variety of issues including changes in village staff; and the need for completion and review of multi-year water flow monitoring data and a variety of background engineering feasibility studies; – the project proceeded much more slowly than the village anticipated with many stops and starts. In the end, the project assisted the village by providing financial resources to help complete some of the background feasibility studies required and to engage a consultant to help village staff and council review the technical studies.

(ii) Village of Valemount - Geothermal Heat Business Plan Development (OBAC Region)

In the OBAC region, the project worked with the Village of Valemount to help fund a business opportunity identification study and the development of a Business Plan for the Village. The business opportunity identification study examined potential business opportunities that could use the 'waste' heat from a proposed Geothermal Power Plant located just outside of the Village. Once potential business opportunities were identified, the consultants retained by the Village prepared a Business Plan for the Village suggesting the most appropriate business model and governance structure for the Village to consider to further explore and secure these potential opportunities.

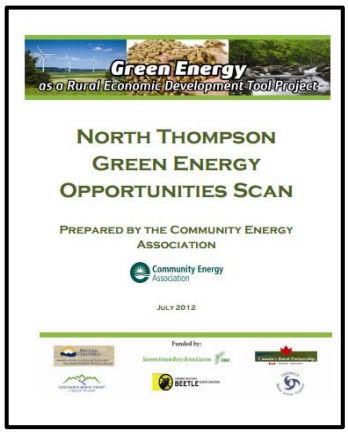
(iii) Cariboo-Chilcotin Region (CCBAC Region)

In the CCBAC region, the project worked with the local School District to explore opportunities to retrofit isolated rural school buildings to install either energy conservation or green energy components. While opportunities were identified – other issues (declining enrollment, other priorities for capital expenditures) - required the School District to postpone decisions on the capital expenditures necessary to invest in and install new capital upgrades.

C.) PROVIDING GREEN ENERGY EXPERTISE AND CONSULTING SERVICES TO RURAL COMMUNITIES.

Another major component of this project was to provide Green energy expertise and consulting services to several communities in the MPB epidemic zone in order to assist those communities with Green energy opportunity pre-feasibility analysis. The project completed several initiatives in this regard.

(i) North Thompson Region Green Energy Opportunity Scan (SIBAC Region)



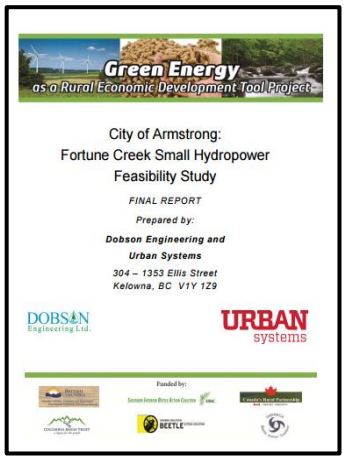
In discussions with SIBAC staff, the local governments and First Nation in the North Thompson region (Barriere, Simpcw First Nation, Clearwater and TNRD Areas A, B and O) indicated a desire to have a Green energy overview analysis prepared for the region. As a result, as part of this project, the Community Energy Association was contracted to complete a Green energy opportunity scan for the region and their respective energy/revenue generating potential for communities in the North Thompson valley.

The research in the scan identified:

a. Results of a high-level scan of green energy opportunities and potential options for the development of energy (heat, electricity, and combined) resources in the North Thompson valley, including micro-hydro, biomass, wind, solar, biogas and geothermal.
b. An assessment of local infrastructure available to support the development of green energy options (i.e. transportation network, water diversions and impoundment infrastructure, transmission lines, biomass sources such as mill waste, etc.).
c. High level information on relative costs and identification of any relevant tenures (e.g. water licenses, Independent Power Producer permits) and land designations/categories (e.g. Indian Reserves, Crown land, Private land, provincial parks, etc.) that need to be considerations in developing green energy projects in the valley.

The final report summarized research results and recommended which green energy options had sufficient potential to consider proceeding with further analysis and which should not be pursued further. The final report was completed August 2012.

(ii) Micro-Hydro Feasibility Analysis for City of Armstrong, Simpcw First Nations and District of Clearwater (SIBAC Region)

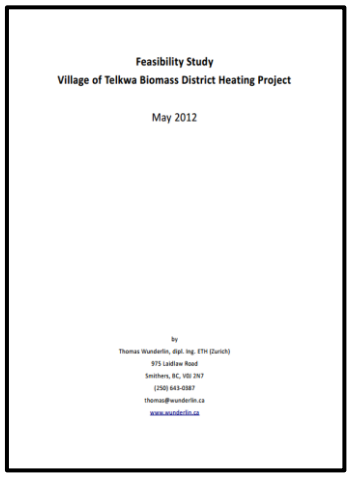


There is a very strong interest amongst many southern interior communities to explore micro- hydro power feasibility analysis. As a result, SIBAC has received several funding requests over the past several years. As noted previously, this led to the SIBAC Board deciding to provide additional SIBAC funding for Green energy related projects. It was also recognized that it would be more cost-effective to combine similar feasibility analysis work for smaller communities under one contract. Therefore the Green Energy as a Rural Development Tool Project provided a small amount of funding towards a larger SIBAC contract with a consulting company to conduct micro-hydro feasibility analysis on a small number of streams identified by Armstrong, Clearwater and the Simpcw First Nations. The majority of the funding for the contract came from SIBAC with financial contributions from the member communities.

(iii) Green Energy Project Opportunity Identification in the Cariboo-Chilcotin

In order to identify potential green energy investment opportunities within the Cariboo-Chilcotin region, the project contracted with the Green Heat Initiative (GHI) to provide feasibility analysis support. GHI staff worked with staff from the two regional School Districts and local First Nations to identify and develop proposals for CCBAC's consideration. This work was completed in September 2012.

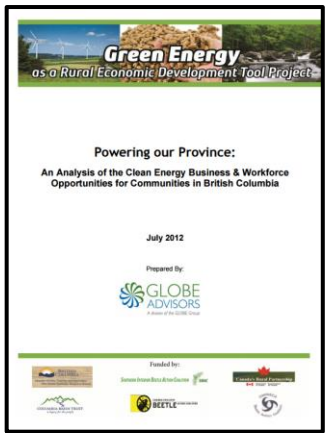
(iv) Village of Telkwa



The project provided funding to the Village of Telkwa to assist the Village in the completion of feasibility analysis, construction cost estimates and financial analysis on the construction and operation of a wood biomass heating system for the Village office and potentially a small District Heating system. As a result of the work completed, the Village of Telkwa was successful in obtaining a major ($600,000) grant through the Federation of Canadian Municipalities to retrofit a municipal building and install a biomass heating system.

The Village subsequently won a UBCM award for the project.

D.) GREEN ENERGY RURAL BUSINESS SERVICES & EMPLOYMENT OPPORTUNITY IDENTIFICATION STUDY



Another major component of this project was to identify potential business opportunities and employment services that rural communities might be able to offer to the Green energy sector in order to increase local rural benefits. As a result, a select Request For Proposals process was held to select a consultant to work on this element of the project. Globe Advisors was selected and engaged through this process to complete the study and prepare a report.

The study explored green energy business opportunities associated with the clean energy sector and Independent Power Producer businesses. The study identified:

- The business services that are currently needed in the clean energy sector and those which will be required to support future growth and diversification of the clean energy sector in BC;
- The labour needs in the clean energy sector (i.e. where are the current and projected labour shortages in the sector and related companies).

The study's final report was based on information gathered through interviews with a representative sample of Green Energy and Independent Power Producer companies in British Columbia. The final report was completed July 2012 and is posted on the project website.

E.) REGIONAL OUTREACH WORKSHOPS TO SHARE PROJECT LEARNINGS

Starting in April 2013, the project organized eight regional workshops throughout the interior of BC in order to raise awareness and encourage use of the project materials. The Project Advisory Committee was involved in providing advice on the location and content of these regional workshops. At each workshop, the Green Energy as a Rural Economic Development Tool Project was introduced with information on the resources and tools available on the website. Two guest speakers presented on the types of green energy operations and provided examples of successful projects. The following communities hosted a regional workshop:

Crawford Bay	Kimberley	Vernon	Nakusp
Kamloops	Clearwater	Smithers	Prince George

In the fall of 2013, the Green Energy as a Rural Economic Development Tool Project also provided a presentation at the Building Sustainable Communities Conference.

The project was also profiled on a Ministry of Jobs, Tourism & Skills Training webinar and through an article in Municipal World magazine.

7. SUMMARY

The Green Energy as a Rural Development Tool Project was a success and achieved its major objectives.

The project support and funding certainly helped the Village or Telkwa to move forward with its biomass district heating system. Both Valemount and Slocan are continuing to examine the feasibility of their green energy projects.

During the project, BC Hydro and the provincial government announced a review of BC Hydro's independent power production purchase policies. This resulted in significant uncertainty for green energy power project proponents (including Valemount and Slocan). Likewise the cancellation of some federal and provincial government green energy funding assistance programs has resulted in somewhat less grant funding (e.g. per kilowatt power produced subsidies) being available to local governments and First Nations. Combined, these forces have resulted in some decline in interest from independent power producers, local governments and First Nations in pursuing green energy projects.

However, given increasing public and political interest and concerns about climate change, it seems likely that new incentives to promote green energy power development will appear again in the near future.

Similarly, the provincial government's recent announcement of additional funding for wildfire hazard fuel reduction around BC communities will likely continue to drive some interest in further biomass heating system developments around the province.

It is believed that the information created through this project will remain relevant and useful for a considerable period of time. As a result, SIBAC will ensure that the Green Energy as a Rural Development Tool Website remains active till at least the end of December 2017. SIBAC will also continue to look for new opportunities to work with partners to facilitate the involvement of local governments and First Nations in green energy projects in rural BC.