



Assembly of First Nations



Mitigating Climate Change

Community Success in
Developing Energy Efficiency
and Renewable Energy
Projects



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A number of people provided information for this report, including the First Nations Energy “Pathfinders” housed in First Nations organizations across the country, the Assembly of First Nations Working Group on Energy and Climate Change, and other technical experts. We gratefully acknowledge their contributions.

We would also like to acknowledge the financial support of Health Canada, which allowed the preparation of this report, and we note that the views expressed in this report are not necessarily shared by Health Canada.



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Introduction

Climate change will have significant environmental, social, economic and health consequences on First Nations communities. Changes in temperature can lead to a disruption in climate patterns such as wind, rain, snow, and storm intensity. As a result, communities may face devastating impacts such as harsh weather conditions, flooding, erosion along shorelines, increased risk of forest fires, loss of glaciers, water shortages and drought, increased risk of pests and disease. In addition, the increased risk of losing many animal and plant species will result in a loss of traditional food source for First Nations communities which will ultimately impact their health and well-being.

“Climate change will disproportionately impact Aboriginal and northern peoples due to geography, reliance on the land, rapidity of change and the limited capacity to adapt. These changes and their impacts will continue and accelerate until global greenhouse gas (GHG) emission controls are in place. Aboriginal and northern communities already face the highest energy costs in Canada, and the solutions to reduce GHG emissions will increase these costs. Costs and future increases will be the highest in communities where electricity is currently generated by diesel fuel.” (Indian and Northern Affairs Canada 2004).

In an effort to increase the understanding and involvement of First Nations in measures to mitigate climate change, the Assembly of First Nations (AFN) has undertaken to identify the opportunities that exist - or can be made available - to deploy renewable energy and energy efficiency technologies in First Nation communities.

Renewable energy refers to several energy sources that all produce electrical, thermal, or mechanical energy without unnecessarily depleting resources and polluting the local environment. Renewable energy can include wind energy, photovoltaic or solar electric, solar water and air heating, passive solar heating, biomass, ground-source heat pumps and small hydroelectric projects. Use of landfill gas is also considered to be renewable and several First Nations are considering this as an option. Biomass includes wood, plant materials, animal waste and municipal/household and industrial waste which are burned to produce heat or electrical energy. The carbon dioxide emitted from burning biomass will not increase total atmospheric carbon dioxide if re-growth of biomass takes up as much carbon dioxide as is released from combustion of biomass.

The United Nations Environment Programme (UNEP 2004) define small hydro projects as those that generate less than 30 MW and further classify these projects into the following categories: micro hydro (less than 100kW, enough power for one or two houses); mini hydro (100kW to 1 MW, a supply for an isolated community or small factory); and small hydro (1 MW to 30MW, typically supplied to a regional or provincial electricity grid).



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Small hydro has also been defined as a water power project that has up to 25 MW of generating capacity (PWGSC 2000: 18).

Energy efficiency measures are designed to reduce the amount of fuel consumed without losing any of the value of the product or process, or affecting the services provided. Examples include weather stripping and caulking, greater insulation, triple-glazed windows, high-efficiency appliances, efficient lighting programs, high-efficiency heating, ventilating and air conditioning (HVAC) systems or control modifications, efficient building design, advanced electric motor drives, and heat recovery systems. Improving Energy efficiency is a technological means to reduce emissions of greenhouse gases without increasing production costs.

What are the challenges currently facing First Nations in implementing RE and Energy efficiency projects on reserves and traditional lands, and can these challenges be met? This report demonstrates that there are several technical and non-technical challenges we would need to overcome to utilize renewable energy sources, improve our energy efficiency and continue to address our sustainable energy needs. Recognizing that First Nation citizens have traditionally lived in close association with the land and continue to rely on this relationship for our livelihoods, physical and spiritual well-being and cultural fulfillment, the AFN is committed to supporting sustainable development opportunities for First Nation communities and citizens.

This report was prepared as part of the AFN's Climate Change Plan, and funded by Health Canada.



Hupacasath First Nation Micro-hydro Plant

With only approximately 250 community members, the Hupacasath First Nation has strategically transformed itself into an economic powerhouse in Alberni Valley, British Columbia. In November 2004, the Hupacasath First Nation commenced construction of a \$13.7-million micro-hydro power plant on the China Creek, located about five kilometres from Port Alberni, British Columbia. The First Nation was able to leverage a \$250,000 loan from Ecotrust Canada to initiate the innovative enterprise, as part of an \$8.5 debt syndicate arranged by VanCity Capital.

“One of the unique things about China Creek is that there has never been a green energy project like this led by a First Nation. We are 72.5 percent owners” says Chief Judith Sayers, Chief of Hupacasath First Nation and President of Upnit Power Corporation.

Upnit owns and operates the micro-hydro plant. The City of Port Alberni, Ucluelet First Nation and Synex Energy control minority shares. Upnit, in the local Nuu-chah-nulth dialect, means “calm place,” a native moniker for China Creek.

The micro-hydro powerhouse will produce about 6.5 megawatts of electricity, enough to power approximately 6,000 households during peak periods. The Micro-hydro plant is a good example of environmentally friendly green energy because hydroelectricity is renewable. In addition, the community has constructed a water diversion channel for the powerhouse to ensure that the project will have no impact on salmon habitat. By replacing a diesel generator as the primary source of energy, the China Creek power project reduces green house gas emissions by 31 kilo tonnes each year, and minimize the potential of soil and water contamination.



The project started five years ago. “BC Hydro wanted a natural gas generation plant here and we had many concerns about its impact on human health,” states Chief Sayers. Her nation worried about air pollution, possible contamination of soil and other environmental effects.

She also knew that given the Hupacasath’s opposition people in Port Alberni would expect high environmental standards from them. She had to ensure that her First Nation didn’t do anything in their own developments that they had spoken out against in the past.





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So with a grant from the provincial Environmental Assessment Office, the Hupacasath contracted Darren Willis, a local consultant to complete a study on alternative energy. The Hupacasath then teamed up with the Pembina Institute to look at these alternatives and in partnership with BC Hydro erected a wind tower to study the possibility of establishing a wind farm. However, test results accumulated over 18 months proved disappointing.

In ruling out the possibility of wind power, Hupacasath First Nation conducted a hydrological survey of their territory. They investigated the 10 best sites for a micro-hydro plant. China Creek won hands-down because the City of Port Alberni had a decade of data on its water flow, and its construction and operation would have minimal effects on the environment.

The Hupacasath signed a long-term Electricity Purchase Agreement with BC Hydro, which is increasing its energy production on Vancouver Island. To build the power generator, the band raised about \$4.5 million in equity from First Nations, government and private sector sources. The rest came from the VanCity Capital debt syndicate and a substantial loan from Western Economic Diversification.

The environmental innovation and business acumen of the Hupacasath is quickly changing attitudes about Aboriginal people. “As First Nations, we’ve always wanted to be a part of economic development, but we’ve been so held back economically,” Sayers says. “Our whole issue now is promoting pride and our culture.”



By lighting homes and businesses with green energy, it seems the Hupacasath hope to enlighten attitudes in the Alberni Valley, too.



Taku River Tlingit Power Station

It began with a simple announcement by the then Minister of Indian Affairs, Robert Nault, and the dedication of \$30,940 in funding from the federal Resource Partnerships Program for Taku River Tlingit First Nation to study the potential for hydroelectric power generation for Atlin in Northern, British Columbia. The community used \$26,190 to develop a strategic plan to build a micro-hydro generating station meet the needs of its 500 residents.



The Taku River Tlingit First Nation wanted to replace its diesel generator with hydroelectric power to improve community's economy, environment and health of its citizens. They also wanted to offer its community members with employment opportunities and training they required in order to work with this project and other resource-related activities.

At the earliest stages in discussing a replacement of its diesel generators, the Taku River Tlingit government pursued the concept of building a small dam on Pine Creek, just east of Atlin and a generating station about 2.5 kilometres away. The First Nation developed a strategic plan that focused on full consultation with community members and discussions with BC Hydro. The First Nation conducted research related to environmental, regulatory frameworks, as well as business and economic considerations. Once the strategic plan was completed, the First Nation commissioned a feasibility study and technical analysis of the micro-hydro project.

The First Nation also conducted a human resources study to determine what kind of training community members needed to compete for jobs in projects that would spin off from the micro plant. Projects such as the micro-hydro project and a bottled water plant.

As a result of the Taku River Tlingits' initiative, BC Hydro has agreed to turn off its diesel generators in favour of hydroelectricity for Atlin. A \$10-million hydro power plant will be constructed along Pine Creek. The power plant will be owned by the Taku River Tlingit First Nation.



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At present, BC Hydro burns approximately 1.2 million litres of diesel annually in its Atlin generators. When the plant is fully operational, the diesel generator will be used on as backup, as the project has no reservoir and they may be future issues related to water supply in the winter. However, community member are pleased the new power plant will eliminate the noise and smoke from the diesel generators.

Energy consultant John Maissan says "On a bigger picture perspective, there will be a significant reduction in greenhouse gas emissions, so environmentally it's very advantageous as well."



"The development of this hydroelectric project is one step towards a brighter future for the Taku River Tlingit First Nation citizens," said John Ward, president of the Taku Land Corporation.

The benefits of the project are far-reaching, creating capacity-building opportunities for local citizens, and providing a secure supply of energy to the entire community, as well as, greenhouse gas reductions of up to 150,000 tonnes over the life of the Energy Purchase Agreement."

BC Hydro and the Taku Land Corporation have signed an Energy Purchase Agreement, which secures a renewable source of energy for BC Hydro and a revenue stream for the Taku Land Corporation for 25 years.

The hydro plant's construction is scheduled to begin next summer and when completed will allow this small, isolated community in the northwest corner of British Columbia to shut down its noisy, pollution-generating diesel generators. Certainly the community will be healthier as greenhouse gas emissions decline-to the tune of about 6,000 tones per year. In addition, there will be far fewer diesel tankers making deliveries, thereby drastically reducing the risk of fuel spills.

Taku River Tlingit First Nation citizens will not only benefit from their own use of clean renewable energy, but they will sell the excess electricity to BC Hydro for distribution. A reasonable return on the investment will be realized over the first 25 years, and once this pay-back period is over, the income stream will grow considerably and continue for at least another quarter century. Income from the power plant will be reinvested in the community in social and cultural programs, and in needed infrastructure. These will benefit the entire community, not just First Nations residents.



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Nacho Nyak Dun Government House

The First Nation of Na Cho Nyak Dun located near Mayo, Yukon, is currently working on plans to construct a new “Government House” for their community. . With this new building, a community hall and office space for each of the separate departments including, social, housing, economic development, etc. will be housed. Finally, all of their government departments will be located within the same building as opposed to being scattered throughout different ones which are in need of repair. For instance, the housing department is currently located in a building that was condemned 10 years ago.

This new “Government House” will be 50 to 75 percent more efficient than an average commercial building. Through an energy efficient design and the use of renewable energy, the government house will emit a minimum of greenhouse gases into the atmosphere. In addition to super-insulated walls and ceilings, it may also be heated by geothermal energy as Mayo sits atop a reservoir of warm groundwater. The First Nation is currently in the process of applying for a grant to secure their plans to have geothermal heating throughout the building. This is a system that uses hot water to heat the building and eliminates the burning of fossil fuels. This would make it one of the most “green” – environmentally friendly buildings in Canada. Designs are included to have a district heating system that will also heat other buildings and residents homes. To date, everything has gone according to plan and construction is scheduled to begin in the spring of 2008.



In the 1950’s, the community was displaced to the edge of Mayo and then moved again in the 60’s to a swamp and permafrost area. As a result, some of the houses are on poor land and will need to be relocated. This initiative is the first step towards achieving the First Nations’ long-term goals of moving the community out of swamp land and into a new

subdivision that will hopefully in 20 years provide the community with all the needed services such as a gas station, store, laundry facilities, etc.

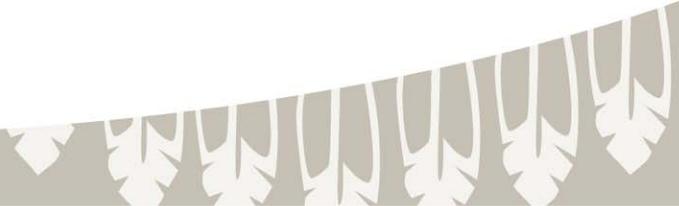
The Na Cho Nyak Dun First Nations’ plans for the new “Government House demonstrates one of the best initiatives and opportunities for energy efficiency and conservation. The community is very excited and proud of their achievements. The Na Cho Nyak Dun First



Nation is very committed to being energy efficient in order to protect the environment for future generations to enjoy.



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Xeni Gwet'in First Nation Solar Power Project

The Xeni Gwet'in First Nation is located in the western Central Interior region of British Columbia. Xeni (Nemiah) is the heart of British Columbia and is the most beautiful country in the Cariboo Chilcotin with much to offer to the people of Xeni, surrounding communities and tourists. The beauty of it all lies in the fact that there is no hydro in Xeni.

Xeni Gwet'in... pronounced "Awney Gwateen", (Nemiah Valley) residents make their livelihoods primarily from ranching, hunting, fishing and are increasingly expanding these activities to accommodate a thriving tourism industry.

In a modern world, administering a community and supporting economic development required at least basic phone service, reliable power distribution and internet connections. For many years a multi-party, analogue VHF radiophone located in the Band Office was the one and only link to the outside world. The community has no access to the provincial electricity or communications grid. In order to get appropriate services, community members must take a 180 km trip to Williams Lake, the nearest significant community with amenities. Many residents recall the frustrations of having to share this crude phone facility which, even if it was operational, was barely audible.



In an effort to modernize its local infrastructure and sustain the pristine environment of the Xeni Gwet'in territory, the First Nation retained Xantrex Technology Inc. to install Hybrid Power Systems combined with solar power in the Xeni Gwet'in First Nation.

"This system is a state-of-the-art off-grid electricity supply." says John Wallace, Xantrex CEO. The Xantrex Hybrid Power

System is well-suited to supply electricity to homes in remote areas. The Hybrid Power system integrates advanced power electronics, a battery bank, and a generator into a single system providing enough electricity to power an average household. The Hybrid Power System can work efficiently with renewable energy sources such as solar power, micro-hydro power systems and small-scale wind generators to produce electricity for use in the home immediately or stored in the batteries for later use. The advanced features of this system include real-time satellite data monitoring, automatic battery conditioning, battery temperature management, and optimal generator fuel consumption. The system also offers comprehensive data logging and advanced partial state of charge operation.



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The Xeni Gwet'in First Nation chose the hybrid power system as it met the Community's standards for clean and efficient electricity systems. The use of a solar array allows community members to power their households with solar energy during the day and the any excess energy generated from the solar panels is stored in a battery bank. At night or when the house electricity demand is high, the power comes from stored energy in the battery. When the battery bank is depleted, the generator automatically turns on and runs efficiently to recharge the batteries.



The hybrid powered system is ideal for Xeni Gwet'in, as their community is in a remote location, more than three hours from the nearest urban center. The system is small, quiet, convenient, cost effective and a tremendous improvement over the existing combustion generator that runs continuously.

"We are extremely happy with the Xantrex system," said George Colgate, Manager of Xeni Gwet'in Enterprise, which provides technical services to the First Nation. "It reduces generator fuel consumption and increases reliability while reducing harmful greenhouse gases. We look forward to eventually installing these systems on 30 other houses in the area."



Rolling River Health Centre CBIP Project

The Rolling River Health Center is a community health facility that services the Rolling River First Nation by Erickson, Manitoba. The nearly 10,000 square foot facility will house the administration office of the First Nations Health Services, several assessment rooms, a dental office, the aboriginal head start program and a host of other health support services. The establishment of the facility within the First Nation has many social benefits including access to health related programs.

The project is considered a success because the First Nation took a leadership role in pursuing an energy efficient building program and the ability of the project Architect Jacques Rollier to facilitate an integrated design process. Additionally, the First Nation and their contractors coordinated funding from the following four programs to support EE components of the project:

- The Manitoba Hydro Power Smart Custom Incentive Feasibility Study Incentive,
- The Manitoba Hydro Power Smart Custom Incentive,
- The Commercial Building Incentive Program (CBIP), and
- The Aboriginal and Northern Community Action Program (ANCAP)

The approximate cost of energy efficiency measures incorporated into the building design totals \$40,000.00. EE measures included the installation of a low wattage florescent lighting and a geothermal heating system.

Preliminary models of the building predict that Rolling River First Nation will save \$6,605.23 in annual operating costs yielding a simple payback of 6.05 years. The energy efficiency measures not only reduce economic costs over the long term, they will also reduce the amount of energy the building consumes and the resulting greenhouse gas emissions. By using an emission factor of 20 grams of greenhouse gas emissions produced per kilowatt-hour, the First Nation calculates that the facility has avoided approximately .75 tonnes of emissions over a 10-year period by using energy efficient technologies.

Furthermore, the geothermal heating system they incorporated into the design will also provide the facility with cooling during the summer months, thereby reducing stress to medical patients and staff. With this feature, the facility could house band members, especially those who are elderly and very young, during severe or extended heat waves that are forecasted for the prairie regions in many climate change models.

The Health Centre project points out the importance of having a clear vision for the project, working with contractors who will support your vision and bringing together funding from many sources to achieve your objectives.



Rolling River First Nation Wind-Monitoring Project

Rolling River First Nation is located by Erickson, Manitoba, erected one 60-meter wind-monitoring tower to collect data over a period of 18-months. The Aboriginal and Northern Community Action Program provided funding to purchase the tower and wind-monitoring equipment. Rolling River First Nation also partnered with the Province of Manitoba, who provided additional funding to contract Phoenix Engineering to complete the wind-monitoring study and provide a wind resource assessment report. Rolling River First Nation recognized the opportunity to coordinate a wind power and monitoring introduction to coincide with the installation of their wind tower.

Rolling River First Nation worked persistently with several project partners to erect the tower. Rolling river First Nation also secured funds to obtain training for both Chief Morris Shannacappo and Elvin Huntinghawk, economic development officer, to gain more capacity prior to the successful approval of funds from the Province and ANCAP National and resulting installation. As a result of this project, the capacity within the First Nation leadership in regard to energy and climate change issues has been increased. This has resulted in the successful construction of a commercial building incentive project and other energy efficient projects related to housing.

If the wind resource assessment report proves positive, the First Nation will begin construction of a wind power farm. This source of renewable energy will be made available to the Province, providing a new stream of economic development to the First Nation, diversification of the First Nations' economic portfolio, and increased employment opportunities for the its' band membership. Furthermore, with the creation of a new wind power source and the establishment of a power purchase agreement, Manitoba Hydro could increase the amount of renewal energy available for sale to Ontario, Saskatchewan, and the United States where non-renewable energy sources continue to be used; thereby reducing greenhouse gas emissions.

Rolling River First Nation's vision of being a renewable energy power producer was made possible through the First Nations pursuit of financial support, capacity building possibilities and technical information. Rolling River First Nation anticipates that its hard work and foresight will lead to the establishment of a wind farm.

This project shows what opportunities might exists if First Nations are able to view their resources in a new way and look to diversify their portfolios with renewable energy projects. The driving force behind the project has been the First Nation's vision, their determination and the existence of a renewable energy champion who has provided consistent effort to realize the project and is motivated to continually move forward. The project was made possible by engaging numerous partners and the First Nation leveraging their own funds.



Skownan Home Energy Efficiency Workshop Project

Skownan First Nation, located in south-western, Manitoba, worked with the Manitoba region Pathfinder to raise the capacity of its community members to reduce their energy consumption costs, help reduce the financial strain on the First Nation while reducing the First Nations' greenhouse gas emissions.

One workshop was held at a community member's house where low-cost, no-cost energy efficiency measures were demonstrated. An EnerGuide for Houses assessor completed the audits prior to and following the energy upgrades to show participants how relatively inexpensive activities can raise the efficiency of their homes. At the end of the workshop, participants received the materials to independently complete the upgrades on their homes.

The First Nation coordinated the participation of community members, the EnerGuide for Houses assessor, a contractor to demonstrate energy efficiency upgrades, other presenters and materials.

This project benefited the First Nation socially by increasing the capacity of several community members on energy efficiency measures and the relationship of home maintenance and energy consumption and the financial and environmental ramifications. By handing out materials required to complete these energy efficiency measures to the participants it increases the likelihood that these will be undertaken in the community following the workshop. It is hoped that the information is passed onto participants' family members and friends in order to further the reach of the workshop. Since the workshop, the Skownan First Nation communicated that the workshop host homeowner reported that his home is more comfortable, his bills have been reduced and he has begun to view his home and the maintenance of his home differently and with more autonomy.

The measures completed on the host home and resulting increase in energy efficiency was substantial but would be minimal in comparison to a larger capital project or in comparison to a residential unit that uses a non-renewable energy heat source. The demonstration also enlightened community members about the importance of regular maintenance of the home to ensure healthy living conditions.

Skownan First Nation's goal was to increase the capacity within its band membership on energy efficiency, home maintenance and the relationship between personal actions and the affects on the larger community. They continue to seek opportunities to build on this workshop.



Swan Lake Community Energy Baseline Project

Swan Lake First Nation, located in South Central Manitoba worked with energy contractors Demand Side Energy Consultants Inc and the Pembina Institute for Appropriate Development to complete a Community Energy Baseline (CEB). The CEB included an energy map and residential energy use survey that together determined:

- The type and amount of energy being used,
- Where the energy is being used (residential, non-residential or transportation),
- The financial and environmental affects of this energy use, and
- How energy was being used within several band members' homes.

The surveys were important in identifying any habits that wasted energy, which existed within in the First Nation on a larger scale. The final report made several recommendations to increase energy efficiency and listed funding bodies that could be accessed in order to complete these. The First Nation has accessed some of these funds and has successfully completed energy efficiency projects.

The First Nation built upon this work and initiated energy efficiency projects with the assistance of funding from Manitoba Hydro's Power Smart programs. The CEB program has increased capacity within leadership, administration and related departments by providing information to the community regarding their energy consumption. The Swan Lake First Nation was able to realize financial reductions and environmental benefits by undertaking several energy efficiency projects related to insulation, lighting and planting trees and shrubs.

The Aboriginal and Northern Communities Action Plan provided the majority of the funds for the CEB program. This funding was leveraged with provincial support to achieve a more holistic picture of energy use in their community. This information helped to enhance awareness. The CEB project did not achieve any direct greenhouse gas emissions.

The Swan Lake First Nation was able to move forward with energy efficiency projects, while keeping in mind the CEB project work, by accessing funds, working with several organizations and coordinating projects that would be most beneficial to the community. Involvement with the First Nation, there has been an overarching community vision that drives many of the project work that has taken place since 2005. Creating and holding true to a long-term, sustainable community vision is often a precursor to successful projects.



Swan Lake First Nation Wind-Monitoring Project

Swan Lake First Nation is located in south central Manitoba within the area known as the wind tunnel of Manitoba. The Reserve is located just 10 km from a 99.5 KW wind farm at St. Leon, Manitoba. The people of the Swan Lake First Nation are Anishinabe and the native language is Saulteaux. The First Nation has approximately 1,100-1,150 band members.

In 2005-2006, Swan Lake First Nation worked with the Province of Manitoba to secure equipment and funding to implement an 18-month wind-monitoring project with the assistance of wind energy experts, Phoenix Engineering. On the advice of its wind energy experts, Swan Lake First Nation established two towers to confirm that their wind resource was adequate and to assess the capacity or size of a wind farm their wind resource could support.

The First Nation successfully secured two 50-meter wind-monitoring towers from the Aboriginal and Northern Communities Action Plan national wind monitoring tower loan program. They also secured additional funding from the Province and contributed financially to contract Phoenix Engineering to complete the monitoring study and produce a wind resource assessment report.

The First Nation worked diligently with several partners, pulling expertise and financial support from federal government departments, the Province of Manitoba, contractors, and the community itself to complete the project. If the wind resource is proved substantial enough, the community's plans to pursue a wind generation station(s), located on its lands, will be realized.

The First Nation envisions providing an environmentally friendly energy source for the community and a revenue stream by selling the power they produce to Manitoba Hydro. There will be jobs created for the members of the First Nation, which provide an impact on the community by improving the standard of living for band members. Additionally, a wind farm would reduce greenhouse gas emissions by generating and utilizing a renewable energy source within Manitoba and through export to regions that continue to rely on non-renewable energy sources.

The Aboriginal and northern Communities Action Plan helped the community's wind-monitoring project by providing the wind monitoring equipment, technical information and support. The project is seen as an investment in renewable energy and it is hoped that Swan Lake First Nation will be able to move forward with a renewable energy project in the near future.



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Chakastapaysin and Peter Chapman First Nations Independent Power Production

What does a community do when industrial and mining development comes into your territory? The communities of James Smith, Chakastapaysin and Peter Chapman First Nations did their homework. They investigated what the mining industry would need in order to maximize their benefits. They discovered that industry requires power and lots of it. The three First Nations chose to forge ahead with developing a 200MW Hydroelectric Dam near “The Forks” of the North Saskatchewan River. The dam which will be entirely located within their lands will provide enough power to supply the needs of a diamond mine that will be potentially developed in the Forte a la Corne area.

The driving force of the Tri-Nations communities of James Smith, Chakastapaysin and Peter Chapman First Nations in the Province of Saskatchewan is goal of self-determination. They don't want to be arm-chair participants in developments that come their way, they want to be part of the action. They recognize that to stop development from happening is often futile so they struck-up the Fort a la Corne Development Corporation which began negotiating equal partnerships with the resource sector in order to ensure that there are enough jobs and profits for everyone. The Tri-Nations will have complete control over the approximate \$750 million hydro project. The area which has always been rich in resource but behind in infrastructure will also receive improved energy and transportation infrastructure.

The road to success is a long one. Developments such as the Tri-Nations Hydroelectric Project have many complexities and take years to plan and construct. The idea of developing a hydro dam in the area began in the late 1970s where a pre-feasibility study indicated that costs and energy output were the greatest risk factors. In 1981, a second feasibility study indicated geology factors as the greatest risk factor. In order to maximize profits based on an energy value of \$85/MW, a recent pre-feasibility looked at costs, geology, and the potential water flow scenarios. To reach profitability, the study indicated that the water head must be 26.6m and utilize 4 vertical turbines.

Currently the hydro project is completing a lengthy series of feasibility studies that take geology, construction and operating costs, energy output, and impact on climate change into account. Other important environmental factors include potential impacts on fish populations and flooding concerns.

As agreements with engineering and construction companies are being signed, and negotiations proceed with SaskPower and investors, the community looks forward to a revitalized economy, social re-investment, clean energy, improved transportation infrastructure, and the implementation of major forestry and agricultural projects.



Black Lake Denesuline Nation Hydro Project

For the Black Lake Denesuline Nation, a remote community in northern Saskatchewan, economic independence is their main driving force to develop a 40 - 45 MW run-of-river hydro project on their reserve lands. Since many of the 1776 members of this Dene community still obtain their living from the land, they wanted a development that would maximize their profits yet cause the least impact to the environment and community members. The hydro project will not involve the construction of a dam or obstruction to waterways. Rather the renewable energy will be extracted directly from the natural fall of Elizabeth Falls on the Fond du Lac River.

Most of the power in northern Saskatchewan has its origins from the Island Falls Generating Station. The reliability of the transmission line that provides power to everyone on this line has become increasingly unstable as demand for power increases. The result is that the north experiences brown-outs. These brown-outs often occur in the deep of winter and the communities, mines and industries must then rely on diesel generators as a back-up source of power.



With the increased concerns of climate change, the members of the Black Lake community have had direct experience with feeling its impacts. Goods such as food, fuel and construction material are transported to the north by semi-truck during the winter when the lakes and rivers freeze to form 'ice-roads'. However, spring has been arriving earlier every year, making spring thaw more difficult to predict. More and more frequently these trucks fall into the lakes and rivers, destroying the goods they carry and

potentially contaminating the waters contained within the lakes and rivers.

In order to attain economic independence, the community wants to own and control 100% of the project, with the exception of limited partnerships between certain stakeholders. The community will finance their project by taking out a "second mortgage" in the amount of \$175 - \$200 million. They have negotiated a Power Purchase Agreement with their primary customer, as well as, secured Memorandums of Understanding with their Limited Partners. The construction of the project is expected to begin in 2008 and end in 2013. Once in operation the project will begin earning profits from the sales of power. All



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limited partners are expected to be paid back at the end of the 5th year following construction. Also, the mortgage is expected to be paid off in 25 years.

To obtain economic independence the Black Lake First Nation is willing to take a risk, the cost of developing a run-of-river hydro project. The rewards of this challenge are enormous. Not only will the community gain profits from the power of sales for many years to come, but each and every member of the Black Lake First Nation will displace over one tonne of greenhouse gases on an annual basis. In total, a net annual GHG reduction of 193,160 tonnes of CO₂ will be felt by all people.



Left to right – Bruce Simms, Project Manager; Richard Robillard, CEDO; Edwin Boneleye, Councillor



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Cowessess First Nation Wind Power Assessment

Economic empowerment through sustainable development is what the Cowessess First Nation hopes to achieve. For this reason, the First Nation chose to harness the wind resource on their urban lands just outside the city of Regina in the province of Saskatchewan.



If there is one thing that the Cowessess First Nation recognizes as key to economic development, it is the importance of location. Their urban lands are located on a major highway which is also close to the TransCanada highway. They are also aware that, as one of Canada's "Cities of Tomorrow", the City of Regina has many needs, with power being one of them.

The prairies have always had a shortage of many things and one of the shortages is water. This becomes a problem for a city like Regina which is not located near a water resource power production. Although the prairies have always been said to be poor in its resources, many can agree that the prairies are rich in wind. By determining the wind resources- and by designing a wind farm for their urban lands, the Cowessess First Nation will negotiate the sales of wind power to the City of Regina, as well as, a Power Purchase Agreement with the provincial electricity utility, SaskPower.

Thus, Cowessess First Nation has acquired funding to study creating alternative forms of energy and ways to use them on their reservation. The grant will fund a two-year study. The study will look at various forms of energy, including wind power. According to Cowessess officials, reservation land near the City of Regina may be the only remaining area where a wind power farm may be feasible. Zoning rules may forbid wind farms close to the City of Regina.

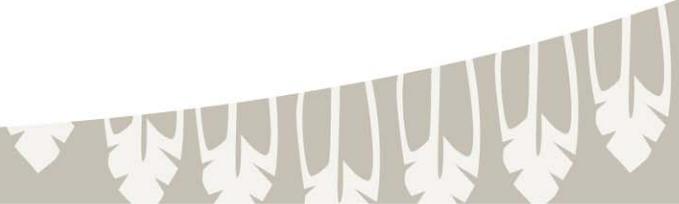


Windmill sentries have been used as a reliable source of energy for many Native American tribes south of the boarder. About 250 turbines can generate enough energy annually to support power to 41,000 people. All things considered, Cowessess First Nation believes that their community is the best place for alternative energy.



“The first step is to do this kind of broad-brushed analysis,” said Chief Pat Sparvier. Cowessess First Nation hopes to complete a more comprehensive study and possibly start construction by 2008.

Assembly of First Nations





Mashteuiatsh Water Plant

Mashteuiatsh had serious portable water problems. For years, small pumps served the remote community of 2,022. Half the time the pumps were broken. Even when all the pumps were working, they were never able to produce enough clean drinking water for the entire community, which affected their quality of life and health.

Proper funding and transparent governance was a problem, particularly when it came to managing the water supply. The lack of clean drinking water led to potentially deadly diseases like cholera and diarrhea. To help address its water challenges, the Mashteuiatsh Council began to lobby and advocate for acceptable water systems. The hard work of the community paid off when the Government of Canada invested over \$4.2 million dollars to bring clean drinking water to Mashteuiatsh.

In the spring of 2007, the Honourable Jim Prentice, Minister of Indian Affairs and Northern Development and Gilbert Dominique, Chief of the Mashteuiatsh Band Council, inaugurated the new water treatment plant of the Innu community of Mashteuiatsh.



“Ensuring that First Nations communities have clean water is one of my top priorities,” said Minister Prentice. “The ultimate goal is to make sure that First Nations residents enjoy the same protection afforded other Canadians when it comes to drinking water.”

The majority of the funding for construction of the water treatment facility was provided by Indian and Northern Affairs Canada which provided \$4.2 million for the project. The community has invested another \$1.2 million. As well, the community of Mashteuiatsh supervised the project from start to finish, in collaboration of the Conseil tribal Mamuitun and various specialists in the water supply/treatment sector.

Mashteuiatsh’s new drinking water plant produces water of a quality complying with the standards under the Protocol for Safe Drinking Water in First Nations Communities and the standards enacted under Quebec’s Regulation respecting the Quality of drinking water. These standards are met through a combination of physicochemical treatment and effective granular filtration, followed by disinfection of water using chlorine and ultraviolet radiation.

Thanks to the new facility, it is anticipated that the community’s water consumption needs can be satisfied for the next 20 years. In addition to the new purification equipment, work was completed expanding the underground drinking water reservoir.