SMALL HYDRO DEVELOPMENT BUILDING POSITIVE RELATIONSHIP WITH FIRST NATIONS STAKEHOLDERS-OUTLOOK FROM SASKATCHEWAN,CANADA

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ABSTRACT

In Saskatchewan, hydroelectric power development has been stalled for a number of years. The last hydroelectric plant was built in the year 1985 and hydroelectric power comprises only 20% of the supply mix. Regulations regarding greenhouse gas emissions and the use of fossil fuels have created a need to add greener sources of power to the SaskPower grid. Saskatchewan has an abundance of water in the northern region of the province that provides the opportunity for significant hydro development. The majority of potential strategic hydro sites are located near First Nations communities making First Nations key partners in the development of potential hydro projects. In Saskatchewan, First Nations communities and their leaders are interested in hydro development projects that have minimal environmental impacts.

INTRODUCTION

This paper examines some of important strategic considerations for the development of Greenfield hydroelectric development projects with First Nations in Saskatchewan.

SaskPower, Saskatchewan’s vertically integrated Crown Corporation utility is working with the Black Lake First Nation (BLFN) on one of the first of its kind – the “Run of the River” Tazi Twé hydroelectric project [1]. The equity ownership, environmental impact, local capacity development and business development, along with community enhancements during the developmental stages of this project, are all unique. Most hydro projects require long lead times, so the development of mutually beneficial relationship with First Nations partner should be a key consideration.

This paper will also examine some of the common practices for collaboration with First Nations partners, including joint preparation for environmental assessments, and the maximization of training, business development & employment, and procurement benefits for the First Nations community. Small hydro projects present tremendous opportunities for community-based initiatives that provide ongoing economic benefits for First Nations. The development of these projects supports the sustainable development of a renewable energy source in Saskatchewan and can be a model for other infrastructure projects.
HYDRO CAPACITY IN CANADA

At present in Canada, Hydropower produces 60% of Canada’s overall electricity. Hydropower is considered a prime source of electricity in Canada and also Canada is the 3rd largest producer of hydro power in the world. A total of 74,000 MWs has been installed in Canada, with a potential of 163,000 MWs available to develop [2]. It is estimated there is 25,000 MW of hydropower potential either being considered or under construction [3].

Chart 1, illustrates the influence of hydro in the provinces like Manitoba, Quebec and British Colombia compared to Saskatchewan, where hydropower is the prime source of electricity. In British Colombia, about 90% of electricity is produced by hydroelectric generation [4]. About 96% of the electricity produced in Manitoba by Manitoba Hydro uses water [5]. For Quebec province, Hydro Quebec generates more than 99% of its electricity through hydropower generation [6].

![Hydro Capacity in Different Provinces, Canada](image)

Chart 1: Hydroelectricity capacity in four major provinces in Canada

SASKATCHEWAN- SASKPOWER FUEL MIX

![SaskPower Available Generating Capacity - 4,281 MW](image)

Chart 2. SaskPower Fuel Mix [data owned by SaskPower]
In Saskatchewan, SaskPower delivers electricity with diverse portfolio of fuel mix as shown in chart 2. Although, hydro currently entails 20% of SaskPower's fuel mix [7].

The need for the power should be a major factor before developing any power option and there is a demand for power in Saskatchewan due to the strong economic growth due to energy, mining, immigration wave and agricultural boom. Chart 3 illustrates load forecast in Saskatchewan. The GDP growth in the province of Saskatchewan from 2012 to 2016 forecast averages close to 3% and current unemployment rate for 2014 is 3.8% second lowest in Canada [8].

**HYDRO PROJECTS IN CANADA WITH FIRST NATIONS AS STAKEHOLDERS**

In principle, small and large hydro power projects are getting lot of traction in Canada and are in a stage of reintroduced development. In the past decade, First Nation communities’ interest in partnering in hydro power projects is driven by sustainable economic, business development and employment opportunities. Additionally, hydro power is a renewable energy source with no toxic waste.

In the past decade, most of the major hydro projects either built already or in the development phase in Canada had a local First Nation’s equity ownership as shown in Table 1.

<table>
<thead>
<tr>
<th>Hydro Project Name</th>
<th>Province in Canada</th>
<th>First Nations Ownership in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wuskwatim (completed)</td>
<td>Manitoba</td>
<td>33%</td>
</tr>
<tr>
<td>Keeyask GS (development phase)</td>
<td>Manitoba</td>
<td>25%</td>
</tr>
<tr>
<td>Tazi Twé (development phase)</td>
<td>Saskatchewan</td>
<td>30%</td>
</tr>
</tbody>
</table>
OVERVIEW-TAZI TWÉ HYDROELECTRIC PROJECT

Currently in Development Phase

The two major factors to consider while developing hydro projects are the long lead time for environmental impact assessment process and local community buy-in.

In Saskatchewan, the most recent hydro plant called the Nipawin Hydroelectric Plant (255 MW) was built in 1985. Out in this province, all the current and potential hydro power projects affect traditional First Nation lands. Chart 3 shows the strong demand for power in a water-rich area like northern Saskatchewan where hydro is touted to be the best option.

A run-of-river facility uses the river directly without modifying the flow and has little or no water storage capacity. The amount of electricity produced varies according to the flow [11]. In springtime when the river fills up with melted snow and ice, the power production is high. In the winter when the river freezes up, or at the end of the summer when it dries up, the power production is low.

If the Tazi Twé facility is built, it is expected to be operational for approximately 100 years, and to generate 50 MW of power, helping SaskPower meet a growing demand for electricity in Saskatchewan’s Far North with a clean, renewable source. The proposed site is located approximately 100 kilometers south of the Northwest Territories border, seven kilometres from the community of Blake Lake [12]. Currently, SaskPower is negotiating the Impact Benefit Agreement with its First Nation Partner.

Pic 1: Location of Black Lake First Nation, google maps [13]
The proposed design below is a “water diversion” type hydro facility that does not require a dam structure on the Fond Du Lac River and as a result, will not flood any land. A portion of the river flow will be redirected through a power tunnel to a downstream powerhouse. The project is designed to use the natural flow of the water as it drops 35 metres from Black Lake to Middle Lake as illustrated in the picture below.

Pic 2: Schematic of Tazi Twé Project by SaskPower

**Project Benefits**

The proposed Project is expected to cost approximately CAD $500 million to develop and build. The Project will generate employment, business and investment income benefits for residents of BLFN and the Athabasca region during the construction and operational phases. The main benefits of the Project include [14]:

- short and long term employment opportunities for residents of BLFN and other residents in the Athabasca region;
- investment in the Project by BLFN will provide a secure, long-term source of income to improve the quality of life for members of BLFN;
- improvement of job skills by local residents engaged in the construction and operations of the Project can be used for future employment opportunities;
- enhancement of business opportunities by local and regional companies in the provision of goods and services to the Project; and
a long-term source of renewable power with low environmental impact that will serve the electrical energy needs of communities and industries located in the Athabasca region.

**Proposed Project Design**

![Picture 3: Tazi Twé Proposed Project Design by SaskPower](image)

**FRAMEWORK FOR COLLABORATION WITH FIRST NATION PARTNERS**

To sustain the momentum and for developing a positive relationship with First Nations as partners, organizations need to develop supporting pillars as shown in the figure 1.

The pillars must include the provision of capacity funding, conducting proper environmental assessments, proactive public consultation process with impact communities, strong hands-on strategies for business development, employment & training programs and local community enhancement as shown in Diagram 1.
Diagram 1: Supporting Pillars

Developing Policies and Procedures

Tazi Twé hydroelectric project development has lead to the development of some of the key policies mentioned below;

- Aboriginal [Note 1] Business Development Policy (provides guidelines for equity ownership for First Nations)
- Aboriginal [Note 1] Employment and Training Policy (provides guidelines for training and employment opportunities for local first nations)
- Aboriginal [Note 1] procurement policy (provides guidelines to single source contracts to local vendors and new business development opportunities)

Note 1: "Aboriginal peoples" The Canadian constitution recognizes three groups of Aboriginal people: Native Indians (commonly referred to as First Nations), Métis and Inuit. These are three distinct peoples with unique histories, languages, cultural practices and spiritual beliefs. About 1.4 million people in Canada identify themselves as an Aboriginal person, according to the 2011 National Household Survey [15]

ENVIRONMENTAL AND SOCIAL CONCERNS

Local wildlife and fishing habitats are an important part of the First Nations day to day life. Significant attention to environmental impact statements and public information programs are
a must as Hydro projects affect the local ecosystem. It is important that every effort is taken to mitigate and avoid causing harm to local bio-diversity [16].

It is necessary to take some pro-active measures, involve local community members regarding the local habitats and the potential impacts. They can provide very valuable information for the project development team.

Pic 4: Artic Grayling in Fond–Du-Lac River, Photograph by Golder Associates

The Environmental Impact Studies on the fish population of the rivers or lakes in the proximity of the project is very important, as is radio tagging of the fish population. Analyzing their movement and understanding the span, areas around the proposed plant, water diversion and tunnels makes a big difference. The other species such as Birds, Amphibians, Mammals, Water Quality, Sediment Quality, Rare Plants, and Traditional Knowledge must be studied along with Social Environment such as Socio-economics, Cultural, Archaeology, and Community Engagement [17].

The impact reviews of the flow scenarios are required for setting the capacity of the plant. It is also part of the Environmental Impact Statement and good for community buy-in. Many detailed studies and mitigation strategies are required. The environmental impact study must cover comprehensive site-specific study of the river system and a fish concentration study around the proposed area [18].

Involving the right environmental experts for the study is very important. Additionally, educating the local community members through project specific public consultation program is required. These processes must provide all the relevant information about design features, fish and other habitats impacts/mitigation strategies, noise, and water monitoring, rock piles and excavation procedures. Public consultation programs must be consistent and involve local elders/community leaders. Having a local language translator is an important part of the public
consultation programs. Bringing the contractor, owners and engineers to some public consultation program meetings builds trust and confidence in the project.

EMPLOYMENT AND TRAINING

The utilization of local community members for employment and training programs enhances community development in remote locations. It provides cost savings, community buy-in and local capacity development. It is very crucial in the early stages of the development phase. Below is the example of training programs that have been delivered in Black Lake.

Training Programs Delivered

Black Lake First Nation and SaskPower are joint partners in the development of the training methodology that aims to create a skilled workforce. Through partnerships with Aboriginal Affairs Northern Development Canada (AANDC), Northlands College, Prince Albert Grand Council (PAGC), and Ministry of Economy, Saskatchewan, an effective First Nation training program for northern Saskatchewan has been delivered in Fall of 2013 and Winter of 2014 for preparing local members prior to construction of the proposed hydroelectric project.

The Employment and Training program is designed to train as many employable people as possible in the Black Lake First Nation (BLFN) and the surrounding regions.

The development of partnerships was instrumental in facilitating the successful delivery of the Employment and Training Program for the Tazi Twé Hydroelectric Project. The delivery of training in the Athabasca region in the past number of years has been very successful through the evolution of new and innovative techniques. Northlands College had been selected by the proponent as the training institution and service provider that delivered the specifically designed training programs for members of Black Lake First Nation.

Pic 5: Black Lake Training Program, Photograph by Ranjith Narayanasamy
The courses developed / offered for the Tazi Twé employment and training programs are focused on the skill sets required to meet the needs of the project. Academic upgrades in Mathematics, English, Science, Safety, and life skills for the students are also included in the course.

The Partnership has developed a broad base of trust and understanding with the project participants and proponents (i.e., the federal and provincial funding partners) that should help minimize any future training or financial risks.

Overall, 49 students from Black Lake First Nation completed Certified Workforce Education and Heavy Equipment Operator (HEO) simulator programs during the fall of 2013 and winter of 2014. Three Black Lake members were employed by SaskPower as full-time apprentices in fall of 2014.

The students used their newly learned skill-sets for fixing homes, windows, and also participated in the energy savings programs offered in Black Lake. The employment & training program accomplishments to date are completely based on the team effort and support from the local First Nation community members and leaders and it is a prime example of local community development and buy-in.

**PROCUREMENT & BUSINESS DEVELOPMENT**

For developing hydro projects, the Owners Engineer Model and Early Contractor Involvement model (ECI) are the most thoughtful models currently adopted by most developers in Canada. For the Tazi Twé project, owners engineer and ECI model are currently being followed. The Owners Engineer with expertise in previous hydro development projects are considered since the approach helps fill the gaps in the expertise and also brings freshness to the methodology.

ECI Model is an open book model that provides the best value for money; develops mutual understanding and shares risks related to the project. Since it is an open book process, it provides First Nation partners and its local businesses with new contracting / business development opportunities. It helps build transparency and trust between proponents with the contractor and vice-versa. The contractor also assists clients in strategies for social license initiatives, environmental strategies and permits required for the project [19].

**CONCLUSION**

Overall, developing any Greenfield hydro projects in Saskatchewan requires good strategies and policies to develop mutually beneficial partnership with the local First Nations. It is important to involve local communities in the early phases of the project development.

The business development, employment & training, environmental and public consultation programs must be developed mutually with consent from the local First Nations. Providing
equity ownership is an important part of community buy-in and also builds the necessary trust for developing hydro projects in Saskatchewan.

References

1. Tazi Twé Hydroelectricity Project http://tthp.ca
2. Hydropower in Canada, IAHR Symposium, Sept 22-24, Montreal, Canada
8. Royal Bank of Canada, RBC Economics Research, Provincial Outlook, December 2014 by Paul Ferley
10. Tazi Twé Hydroelectric Project http://tthp.ca
12. Tazi Twé Hydroelectricity Project http://tthp.ca
13. Location of Black Lake First Nation on Google maps https://maps.google.ca/maps?q=black+lake+SK&hl=en&sspn=0.107855,0.32959&t=h&hnear=Black+Lake,+Division+No.+18,+Saskatchewan&z=15&iwloc=A
15. Aboriginal Affairs and Northern Development Canada, Aboriginal Peoples and Communities https://www.aadnc-aandc.gc.ca/eng/1100100013785/1304467449155