

Barriers to Renewable Energy Development in British Columbia's Remote Communities

by

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ABSTRACT

This paper explores the challenges and proposes potential solutions to alternative energy development in British Columbia's remote communities.

I interviewed seven remote communities that are working toward, or who have completed, energy development projects in BC. The barriers and challenges identified by communities confirmed some of what has been noted in earlier international and domestic research. However interviewees highlighted issues that are uniquely tied to the British Columbia's remote community energy (RCE) context. The specific challenges of working in very small resource-stretched communities are amplified by the numerous and uncoordinated programs that they must work with to meet their energy goals.

Three proposals that mitigate some of the challenges identified by interviewees are proposed for consideration:

1. The existing suite of programs targeted to RCE development should be simplified and coordinated
2. Greater effort should be put forth to facilitate communities who take on project development
3. Investments should be targeted to training and community capacity development.

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EXECUTIVE SUMMARY

There are 35 British Columbian remote communities with more than ten permanent full-time residents that are not connected to either the North American electricity grid, or the natural gas network. Many of these communities rely on costly “electricity service [that] is characterized by sub-standard reliability, provided by ageing assets that are poorly maintained and highly inefficient” (BC Hydro, 2009).

CURRENT CONTEXT

In its 2007 Clean Energy Plan, the provincial government asked BC Hydro to provide low-cost, reliable electricity to any remote (with more than ten permanent full-time residents) community that expressed interest. Following the province’s request, BC Hydro created the Remote Community Electrification (RCE) program (a ten-year initiative) to achieve its mandated goals. To date, 18 communities have engaged with the RCE program; three have been connected to the provincial grid network, one has had three diesel generators installed. The fourteen other communities are in various stages of project consideration or development while the remaining 17 have not yet expressed interest to the utility. If the program achieves its goals, there will be a lot of new electricity development in the province’s remote communities over the next five years (the remaining period in which the program is active). This presents an opportunity for communities to move away from their historical reliance on diesel power and towards cleaner generating alternatives.

Both the province and the federal governments have recognized this opportunity and have funded programs to assist communities in achieving their clean energy goals; these government programs are further supported by programs delivered by provincial NGOs. The majority of these programs are delivered in the form of grants and contributions.

Despite their initiatives and the resources being dedicated to the cause, only a handful of British Columbia’s remote communities have replaced diesel as their primary fuel source.

RESEARCH METHODOLOGY & FINDINGS

The goal of this research is to understand why so few communities have made it through the RCE program and developed alternative energy capacity. Seven communities at various stages of project development were interviewed and asked explicitly to comment on barriers to clean energy development that they experienced.

Community responses fell largely into two categories: those that were site and community specific, and those that were more broadly encountered. The latter are the focus of the report.

Developing any type of large infrastructure is necessarily very complex and energy projects are no different. The complexity of these developments is amplified by the unsystematic and piecemeal grants and contributions that communities rely upon. Furthermore, the lack of adequately trained personnel within small remote communities exacerbates the issue. These challenges – which were broadly expressed – are the focus of the proposals in this report.

PROPOSED SOLUTIONS

Three initiatives are proposed to address the challenges of program complexity and lack of capacity identified by communities.

1. **Simplify** programs communities work with by coordinating and harmonizing existing initiatives;
2. **Facilitate**. The Provincial Ministry of Energy and Mines (MEM) assists communities as they work through each stage of energy and project planning and expand the existing mentorship program to promote knowledge sharing between communities and individuals familiar with aspects of energy development;
3. **Equip** communities to manage the most challenging components of the development process through targeted workshops and educational initiatives.

For the most part, the proposals build on existing initiatives to better meet community needs.

EVALUATION

The evaluation of the proposals focuses on the ease with which they can be implemented, as well as how the target communities will receive them. Six measures are used to capture these criteria:

Feasibility:	Community Acceptability:
1. Coordination	4. Time
2. Mandate	5. Cost
3. Resources	6. Support

There are tradeoffs to each of the policies presented, and the evaluation highlights the strengths and weaknesses of each of the proposals.

Simplify, for instance, necessitates coordination among program providers to be successful (and for that reason scores poorly on coordination), but it scores very favourably in all measures of community acceptability. **Facilitate** is the expansion of existing programs that communities appreciate and rely upon; accordingly it scores well on both measures of community acceptability and feasibility. **Equip** is a proposal for a new program that requires additional personnel and funding resource and will take time to implement. The proposal also requires community participation (and therefore, their time – a scarce resource), and does not have the same direct short term impact that the other proposals do.

RECOMMENDATIONS

Ultimately, the recommendations do not deviate significantly from current programming; they are simply suggestions for incremental reforms that will facilitate more efficient navigation of remote communities through the energy development process. The recommendations are:

1. Work should begin to streamline, harmonize and reform existing initiatives.
2. Staffing levels should be increased at MEM to enable more active engagement with communities. Increase funding to further develop the mentorship program.
3. Use the feedback from MEM staff and mentors to better understand gaps in community knowledge and skills. Use this feedback and consider the development of targeted workshops and educational initiatives to fill those gaps.

ACRONYMS

AANDC	Aboriginal Affairs and Northern Development Canada
EC	Environment Canada
EPA	Electricity Purchasing Agreement
FBC	Fraser Basin Council
MEM	Ministry of Energy and Mines
NRCAN	Natural Resources Canada
RCE	Remote Community Energy
RCCEP	Remote Community Clean Energy Program (MEM department)
RCEP	Remote Community Electrification Program (BC Hydro department)
RCI	Remote Community Implementation (FBC Initiative)
RET	Renewable Energy Technology
TRTFN	Taku River T'lingit First Nation

1. INTRODUCTION: CLEAN ENERGY IN REMOTE COMMUNITIES

There are 35 remote communities in British Columbia with more than ten permanent residents that are not connected to the provincial electricity grid or the natural gas network. Nearly all of these communities rely on diesel for their power, whether it is centralized (with transmission that runs throughout the community) or decentralized (each home or building has its own power source). These off-grid diesel systems are unreliable; the fuel costs are high and unpredictable; GHG and air contaminant emissions are localized and harmful and transportation of fuel over long distances to service the community is environmentally risky.

1.1 SUPPORT FOR COMMUNITIES

Both Federal and Provincial governments support remote community clean energy development through a number of programs and departments. The most relevant of these is BC Hydro's Remote Community Electrification (RCE) program, which began operating in 2008. The Province supports the work of the RCE program through the Ministry of Energy and Mines' (MEM) Remote Community Clean Energy Program (RCCEP).

The Federal government also has programs that assist remote communities undertaking energy development projects. The Federal government's programs are run primarily through Natural Resources Canada (NRCAN) and Environment Canada, and for First Nations communities through Aboriginal Affairs and Northern Development Canada (AANDC).

In addition to government-led programs, a number of NGOs deliver initiatives targeted specifically to communities planning community energy projects. With the exception of MEM and BC Hydro, these organizations (both government and non) provide support to communities primarily through the provision of grants and access to low-interest financing.

The following table highlights some of the programs that offer support to communities for RCE development:

TABLE 1: A SELECTION OF ENERGY-RELATED FUNDING AND SUPPORT PROGRAMS

Federal	Provincial	NGO
<ul style="list-style-type: none"> - NRCAN <ul style="list-style-type: none"> ▪ EcoEnergy ▪ CANMET - Environment Canada <ul style="list-style-type: none"> ▪ EcoAction - Ministry of Finance <ul style="list-style-type: none"> ▪ P3 - Western Economic Diversification Canada - Rural Secretariat <ul style="list-style-type: none"> ▪ CDP 	<ul style="list-style-type: none"> - MEM <ul style="list-style-type: none"> ▪ Remote Community Energy Program ▪ ICE Fund - BC Hydro <ul style="list-style-type: none"> ▪ Remote Community Electrification - Climate Action Secretariat <ul style="list-style-type: none"> ▪ Pacific Carbon Trust - Ministry of Community, Sport and Cultural Dev't <ul style="list-style-type: none"> ▪ Local Gov't Infrastructure Planning 	<ul style="list-style-type: none"> - Fraser Basin Council <ul style="list-style-type: none"> ▪ Remote Community Implementation - UBCM <ul style="list-style-type: none"> ▪ Gas Tax Fund - Federation of Canadian Municipalities <ul style="list-style-type: none"> ▪ Green Municipal Fund - Bioenergy Network - Island Coastal Economic Trust - Columbia Basin Trust - NKDF Development Fund - Pacific Carbon Trust <ul style="list-style-type: none"> ▪ Community Development Program
<ul style="list-style-type: none"> - AANDC <ul style="list-style-type: none"> ▪ ECO Energy ▪ Major Project Infrastructure Fund ▪ Economic Development ▪ Economic Opportunity ▪ Strategic Partnerships Initiative 	<p style="text-align: center;">First Nations Specific</p> <ul style="list-style-type: none"> - MARR 	<ul style="list-style-type: none"> - FNEMC - All Nations Trust Company <ul style="list-style-type: none"> ▪ First Nations Equity Fund - New Relationship Trust <ul style="list-style-type: none"> ▪ Governance & Capacity Building - EcoTrust <ul style="list-style-type: none"> ▪ First Nations Regeneration Fund - Coast Opportunity Fund

Source: Program websites & MEM *Funding and Support Guide*, 2012

1.2 THE ROLE OF BC HYDRO'S RCE PROGRAM

In the 2007 Clean Energy Plan, the Provincial government asked BC Hydro to provide remote communities with reliable power at the same rate as other non-integrated areas (NIA). The non-integrated area rate is a heavily subsidized 6 to 10 cents per kWh electricity rate that is offered in several parts of the province¹. BC Hydro created the Remote Community Electrification Program (RCE) to undertake the government's request. Under this program, if the community chooses, BC Hydro will take-over electricity generation and sell the community power at the subsidized rate. For communities that do not have a centralized system, BC Hydro will develop

¹ Transmitting electricity in remote and rural areas is more costly than in urban areas (this is simply a matter of economies of scale – the population of remote and rural areas is smaller and less dense than urban areas, but the infrastructure required to distribute electricity is more or less the same). Furthermore, new electricity is much more expensive than the electricity provided by the province's heritage assets (regardless of location, it is more costly; however cost is amplified in rural and remote locations). Therefore, the price that is offered to NIAs, is not a true reflection of the cost of building and transmitting new electricity to those areas, and is subsidized by all of BC Hydro's ratepayers.

a project, maintain ownership of it, and sell power to the community at the same subsidized NIA rate as above².

There are two compelling reasons for communities to participate in the RCE program:

1. Cost – BC Hydro subsidizes rates to remote communities to bring them on par with rates charged to other non-integrated areas. Currently, the power delivered in First Nations is partially subsidized by AANDC, whereas civic communities receive no subsidy.
2. Reliability – BC Hydro guarantees a standard of reliability for electricity delivery. For remote communities, the same standard that exists for NIA communities is applied. In one community, Toad River, for example, BC Hydro installed three diesel generators in order to meet this reliability threshold.

When a community asks BC Hydro to provide their power, the utility will take over existing assets, which are, in their words: “characterized by sub-standard reliability, provided by ageing assets that are poorly maintained and highly inefficient” (BC Hydro, 2009). These ageing assets require upgrading or replacement, and frequently new capacity must be installed to meet reliability standards and growth projections. BC Hydro has a target of delivering renewable power³ to fifty-percent of the communities that participate in the RCE program⁴.

1.3 WHO DEVELOPS THE POWER?

Communities engage with the RCE program because they see energy projects as a way to stimulate economic development and community growth. (18 communities were involved with BC Hydro’s RCE program in 2011.) Reliable long-term power purchased directly from the utility at low-rates is attractive to investors, businesses and prospective residents. Many communities

² In this scenario, the community would be responsible for building a distribution system to get the power into resident’s homes.

³ Renewable power and alternative energy are used interchangeably throughout this paper. Small-hydro (run-of-river), biomass, and wind projects (sometimes with diesel backup systems) are the most frequently considered sources of alternative power in British Columbia’s remote communities.

⁴ This is the goal of the RCE program, however BC Hydro is bound by the BCUC to protect all provincial ratepayers and are thus compelled to develop the lowest “financial” cost option. BC Hydro uses the triple bottom line to evaluate options: financial, environmental, social costs – however the mandate of BC Hydro to protect rates, requires that BC Hydro justify projects with higher financial costs despite their social or environmental benefit. It is challenging to place appropriate monetary value on the environmental and social costs of one energy project versus another.

also see benefits to building community-owned power options; having full ownership of the project puts the community in a position to sell their power to BC Hydro and buy it back at the subsidized rate, creating an ongoing revenue stream. Additionally, building and maintaining a project has job-creation benefits.

Building new electricity infrastructure is necessarily a very complex task for communities to take on, however the benefits of community ownership, are enough to compel many communities to go this route.

TABLE 2 - BENEFITS TO COMMUNITY-LED PROJECT DEVELOPMENT

BC Hydro Ownership

- Simpler
 - Electricity experts lead and develop project

Community Ownership

- Greater autonomy over projects/ land
- Revenue stream & job creation
- Leverage for future community investments

1.4 INTENT OF THIS RESEARCH

BC Hydro’s RCE program is scheduled to conclude in 2017. Regardless of whether BC Hydro or the communities build the projects, if the RCE program is successful, the next five years will see significant new electricity capacity added to remote communities. This presents an opportunity for provincial communities to move away from their historical reliance on diesel generators and move towards cleaner generating alternatives. The Province recognized this opportunity in 2008 and committed \$20 million to promote community-owned alternative energy projects through MEM’s Remote Community Clean Energy Program (RCCEP). This priority was bolstered federally, when in the 2011 Speech from the Throne, the newly elected majority Conservative Government of Canada committed to “promote ... the deployment of clean energy technology in Aboriginal and northern communities” (Government of Canada, 2011).

Despite the abundance of initiatives available to communities, and the compelling reasons to do so, very few have displaced their reliance on diesel power with cleaner generating alternatives. Of the thirty-five communities that are eligible for BC Hydro’s Remote Community Electrification

Program, close to twenty have worked with the utility and ten have been added to the *remote communities regulation*⁵.

POLICY PROBLEM

Governments and NGOs have prioritized the uptake of alternative forms of energy, but despite their initiatives and the resources being dedicated to the cause, only a handful of British Columbia's remote communities have replaced diesel as their primary fuel source.

The first aim of this study is to understand the challenges British Columbia's remote communities encounter as they consider their energy prospects and work through the energy development process. Of the seven communities that participated in this research, four have, or will be developing community owned projects. Of the three remaining communities, BC Hydro built and owns one community power project, another was connected into the main BC Hydro grid and one community remains undecided. Probing these communities to understand their experiences provided valuable insight into the challenges of remote community energy development.

The core research finding is that ***the complexity of the energy development process is compounded by the lack of personnel resources in small remote communities***; this ultimately discourages or terminates community alternative energy plans.

The second aim of the study is to examine incremental policies that have been proposed to mitigate these challenges by:

1. **Simplifying** programs communities work with and through;
2. **Facilitating** communities as they work through each stage of energy and project planning and expanding mentorship program to promote knowledge sharing between communities and individuals familiar with aspects of energy development; and
3. **Equipping** communities to manage the most challenging components of the development process through targeted workshops and educational initiatives.

⁵ Communities that have been added to the remote communities regulation have applied to the utility to have electrical service provided at the rates NIA established under the Utilities Commission Act.

This study concludes by acknowledging that not all communities will develop alternatives to diesel power, because the resources (either physical or community-based) do not exist or the costs are too high. But improvements to the existing policy framework can ensure that communities with development potential will have the, support and tools to pursue energy solutions that are right for them.

2. BACKGROUND: RCE DEVELOPMENT AND ITS CHALLENGES

2.1 THE CASE FOR REPLACING DIESEL

Nationally, nearly three hundred communities in Canada with a combined population of 200,000 are not connected to the North American electricity grid or the piped natural gas network. Most of them rely on diesel generators to meet their electricity needs. Seventy-nine of these communities are found in British Columbia. Of the 35 communities that have more than 10 permanent fulltime residents, 21 are First Nation, 14 are civic, and they have a combined average of 26 dwellings (BC Hydro, 2009 & BC Hydro, 2010).

Diesel is a sub-optimal electricity source for several reasons (cost and environmental harms are the most noteworthy). The cost of electricity generated by diesel power plants can be 5-10 times that of conventional grid connected power plants (Weiss et al, 2008). Fuel costs for the recent Toad River diesel installation by BC Hydro were estimated to cost \$236,000 in their first year – this for a customer base of 27 accounts and less than 100 individuals. The estimated 25-year present-value cost of Toad River installation is \$363,000 per customer (BC Hydro, 2009). In many instances these costs exceed or are on par with cleaner, localized generating alternatives.

The localized impacts of diesel generation include air quality impacts caused by NO_x, SO_x and other particulate emissions, as well as noise pollution caused by the hum of the diesel generator. In addition there are significant environmental risks associated with transporting diesel fuel over long and often difficult routes to remote communities.

For all of the above reasons, both federal and provincial governments have introduced programs to hasten the displacement of diesel power with cleaner alternatives. Despite these initiatives, very few of British Columbia's remote communities have made the switch. A brief look at international and domestic research provides some insights into the challenges of remote community clean energy development.

2.2 COMMON CHALLENGES: A LOOK AT INTERNATIONAL AND NATIONAL RESEARCH

Publications and research on the deployment of renewable energy sources in remote communities is predominately found within the development literature. Although the challenges faced in British Columbia are unique, insights can be gained by looking at barriers to renewable energy technology (RET) deployment internationally. In a study of small-island developing states, Weisser (2000) identified limitations in institutional and human capacity; inadequate

financing capabilities and simply a lack of knowledge about RETs as three extensively documented hurdles faced by remote communities. Painuly (2000) developed a research framework for assessing community-specific barriers to renewable energy penetration and options to overcome them. In laying the foundation for assessment, Painuly identified several overarching issues that consistently inhibit the adoption of RETs, these include: cost effectiveness, technical barriers, market barriers, inconsistent pricing structures, institutional and political and regulatory barriers. These broad categories encompass much of what is identified in the literature.

International publications provide relevant high-level insights. However, the problem of diesel displacement in Canada's remote communities is domestically distinct for several reasons. Foremost is the overlapping regulatory institutions, especially for First Nations, who make up half of British Columbia's remote communities. First Nations communities must not only work within their own governance structures, but must also interact with the federal government through AANDC, as well as with provincial government and its utility. The complexity of this relationship uniquely affects the way remote renewable development is undertaken in BC.

Very few publications focus on domestic challenges to renewable energy uptake, much less those that are specific to British Columbia. The seminal study that first detailed remote Canadian community energy profiles was published in 1985. Compiled by Sigma Engineering for Energy Mines and Resources Canada, this report laid the foundation for RetScreen 98 – NRCAN's renewable energy project assessment tool for remote communities. Version 98 of the RETScreen tool includes a database of more than 300 Canadian remote communities (including the nearly 80 identified in BC). The information provided in the database covers general community level data (population, installed electricity capacity, local fuel prices) as well as renewable energy resource data (local estimates of windspeed, biomass density, hydrological data, etc.). The information presented in this tool has not been updated since its 1998 release.

This initial deep survey laid the foundation for relevant domestic research. Ah-You and Leng (1999) identify three main barriers to the growth of renewable energy projects in Canada's remote communities: presence of subsidies that distort market decisions, a lack of technical expertise and a lack of tools for evaluating projects. A survey conducted by Weis, Ilinca and Pinard (2008) effectively demonstrated that perceived barriers to RET uptake differ considerably by stakeholder. In their study of *stakeholders' perspectives on barriers to remote wind-diesel power plants in Canada*, Weis et al. (2008) broadly categorized barriers for this RET and asked

groupings of stakeholders to attribute a rank to each. Capital costs and operation and maintenance costs were major concerns across stakeholder groups (notably, communities were not surveyed). Interestingly, utilities identified the maturity of technology as the number one barrier, far above the ranking of any other stakeholder group.

A report published by Canada's Rural Partnership (2009) outlined a number of barriers common to clean energy development, several of which were specific to remote and rural communities. Key barriers identified were difficulties in attracting investment due to the perception of high financial risk in small communities, the cost per unit of energy produced, lack of awareness about renewable energy potential, and the lack of ownership of renewable resources. Lastly, personnel capacity was identified as a limiting factor to energy development as "renewable energy systems require experts to advise on best installation practices, navigate permits and approvals, liaise with the community, and ensure maintenance practices are followed." The Rural Partnership (2009) cited census data that indicated :

"Predominantly rural regions have a higher concentration of unskilled occupations, within most industries, compared to predominantly urban regions.

"During the 1990s, predominantly rural regions tended to become more intensive in unskilled occupations, within most industries" (online resource).

2.3 PROVINCIAL SPECIFICS: WHY THE HOLD UP?

A narrowly focused white paper presented by BC Sustainable Energy Association was researched and assembled "using insights and experiences shared by industry players in the small-scale renewable energy sector" (BCSEA, 2010). The paper identifies some issues that are unique to private developers, however there are broader challenges that affect community driven project development, specifically extensive red tape involved in renewable energy planning and approvals. In addition, BC Hydro's mandate to provide low cost energy results in the lowest-cost option, whether it is diesel or not, being favoured over other "cost effective environmentally appropriate solutions."

A 2008 meeting of the members of the provincial Remote Community Energy Network (RCE Network) – a group made up of MEMPR, AANDC, BC Hydro and First Nations Technology Council (FNTC) – identified nine areas which present challenges in remote community energy projects. Foremost was capacity, including the limited number of personnel and burn out rate of staff, the skill sets and availability of staff vary over time, and that each program communities

engage with requires additional capacity. Issues of financing, including the lack of secure funding for management costs, coordinating financing between agencies and the long time lag were all identified as challenges or barriers to community energy projects. Finally, the complexity of environmental approvals, conflicts between community energy plan recommendations and what the utility is able to do, as well as difficulties in forecasting demand were further challenges identified by RCE Network members.

2.4 SUMMARY OF BARRIERS IDENTIFIED IN THE LITERATURE

The barriers discussed above fall broadly into four categories: technical, financial, institutional and community and are summarized in **Table 3**, below:

TABLE 3: SUMMARY OF BARRIERS IDENTIFIED IN THE LITERATURE

Category of Barrier	Specific Challenge	Description	Report
Technical	Familiarity	Lack of information on technology, its costs, benefits or the resources required increases uncertainty.	Sigma Engineering (1985); Martinot and McDoom (2000); Painuly (2000); Painuly (2001); Weis, Ilinca and Pinard (2008); Weisser (2000 & 2004); Rural Secretariat (2012)
	Detailed Resource data	Detailed resource data (wind speeds, biomass, water flow) is unavailable for the region, difficult to assess and costly to procure.	Sigma Engineering (1985); Ah-You and Leng, (1999); Painuly (2001); Weis, Ilinca and Pinard (2008); Rural Secretariat (2012)
Financial	Access to Financing	There may be capital available in financial markets, but businesses, individuals and remote communities may find it difficult to qualify for.	Sigma Engineering (1985); RCE Network (2008); Weisser (2000); Rural Secretariat (2012)
	Incentives	Subsidies shelter the true cost of energy and leave the energy consumers with limited incentive to conserve energy or improve the supply.	Sigma Engineering (1985); Painuly (2000); Ah-You and Leng (1999)
	Cost	It is simply more expensive to develop renewable energy project than to install diesel power.	Ah-You and Leng (1999); Weis, Ilinca and Pinard (2008); Rural Secretariat (2012)
Institutional	Fragmented approach	“A comprehensive policy at each level of government is far more effective in encouraging the deployment of renewable energy than a patchwork of policy frameworks and approaches” <i>Rural Secretariat (2012)</i>	Sovacool (2009); BCSEA (2010)
Community	Requires project champion	Without an individual to spearhead a project, and stick with it for the duration (often several years) it is difficult for projects to get off the ground.	Sigma Engineering (1985); RCE Network (2008)
	Personnel resources	The dedicated personnel and the variety of skills needed to develop manage and operate a project is not present in all communities	Sigma Engineering (1985); Painuly (2001); Ah-You and Leng (1999); Weis, Ilinca and Pinard (2008); Rural Secretariat (2012); RCE Network (2008); Rural Secretariat (2012); Weisser (2000)

3. RESEARCH PROCESS

3.1 GOAL

My preceding review of both international and domestic literature has provided a broad foundation upon which to understand the challenges to energy development in small communities. The insights from British Columbia's Remote Community Energy Network provide an understanding of the uniqueness of the provincial energy sector and how that impacts its remote communities. In taking this research one step further – by speaking with remote communities who are engaged in energy development – my goal is to generate a better understanding of the experiences of British Columbia's remote communities as they evaluate community energy options, and to use these insights to help mitigate the challenges they encounter.

3.2 METHODOLOGY

There are two relevant perspectives for identifying barriers to the renewable electrification of British Columbia's remote communities: foremost, that of the communities themselves, and secondly that of the members of relevant government and civil organizations. This study combines those two perspectives to deliver broadly relevant proposals to mitigate challenges to remote community energy development.

This was accomplished through the following steps:

1. High-level discussions with relevant government and non-government organizations (e.g.: BC Hydro, MEMPR, AANDC, Fraser Basin Council, ECO Trust, etc.) were used to gain an understanding of the programs and institutions British Columbia's remote communities work with.
2. A selection of community interviews were undertaken to build upon the literature and define the challenges encountered by British Columbia's communities.
3. Analysis of interviews combined with the insights from the literature was used to identify key areas of focus to mitigate barriers to RCE development.

3.3 BACKGROUND DISCUSSIONS WITH STAKEHOLDERS

Prior to conducting the community interviews, I spoke with stakeholders responsible for several of the key energy programs communities interact with. I spoke at length with

individuals from BC Hydro, the Ministry of Energy, Aboriginal Affairs and Fraser Basin Council to understand their programming and to ask their perception of the challenges to RCE development. I also met with organizations that provide low-interest financing to projects as well as private developers that have worked in remote communities in the past (however, generally on much larger, eventually grid connected projects). These conversations laid the foundations for my understanding of the framework the Province's communities work through. They also helped to focus the direction of the interviews. It became clear through these conversations that stakeholders have perceived challenges that are common across communities, but that ultimately the value-added of this project would be to address issues identified by the communities these stakeholders work to serve.

3.4 COMMUNITY SELECTION

Of the seventy-nine communities that fall under NRCAN's remote community classification, roughly thirty-five have at least ten permanent fulltime residences. This is the threshold for a community's consideration under BC Hydro's Remote Community Electrification (RCE) program, and was accordingly the cutoff for communities engaged in this research project. Within this group of thirty-five there are varying levels of interest in and engagement with renewable energy project development.

Ultimately, seven communities participated in this project. **Table 4**, on the following page, provides a snapshot of the energy needs and resources of each of the participant communities.

TABLE 4: INTERVIEWEE COMMUNITY ENERGY PROFILE

	Population	Installed Capacity (kWh)	Utility Peak Load (kWh)	Annual Energy Demand (mWh)	Region	Dominant Electricity Source
Atlin	460	2.3 MW	1280.00	4104.00	Skeena	Small Hydro*
Douglas/ St'at'imc	330	N/A	502	3700	Thompson	Grid *
Hartley Bay	170	450	450	2000	Skeena	Diesel
Hesquiaht	25-35 families	100	-	438.00	Van. Island	Diesel
Seymour Arm	62	N/A	N/A	N/A	Thompson	Decentralized
Toad River	60	~800	235	850	Peace	Diesel*
Tsawatanieuk	90	-	400	-	Vancouver Island	Diesel

* New development

The communities were selected based on the following criteria:

1. The community is (or was) not connected to either the provincial electric or natural gas network, and they have more than ten permanent full time residents.
2. The community is, or has been, involved in community energy planning and the replacement of the existing system of community power generation.
3. There was an individual within the community who was involved with project planning who was willing to participate in the research.

Within each of these communities the individual responsible for community/economic development was contacted for an informal interview. Interviews were standardized and open-ended. Focused around five questions, the interviews ensured relevant topics were covered while enabling participants to fully express their experiences, and allowing me the opportunity to ask follow-up questions. The goal of the interviews was to gain an understanding of the experience of community leaders as they undertook energy projects and to have them explicitly identify challenges they encountered in the process.

3.5 CONFIDENTIALITY

The province's remote communities are heavily reliant on federal, provincial governments, and NGO programs. In this research, I have asked communities to explicitly identify challenges to RCE development, and understandably, this often required them to comment on organizations and institutions they frequently interact with. Understanding the awkward position this put interviewees in, I have kept their identities anonymous⁶. However, anonymity is a deceptive term in this instance, as the limited size of the communities and the provincial energy scene make it likely that the individual I spoke with in each community is obvious to those involved in remote community energy development. Because retaining the anonymity of the interviewees only goes so far in protecting the community I also chose to keep community barriers generalized and not go into detailed examples or specifics that have not been previously published. Some may feel this undermines the rigour of the findings from the community interviews, however I feel it is a necessary precaution when dealing with such a small and interdependent scene. I have made every effort to include all of the relevant feedback given by interviewees in the manner in which it was expressed.

3.6 COMMUNITY CASE STUDIES

3.6.1 ATLIN

Atlin is a community of 400 residents, roughly 110 of whom are a part of the Taku River T'lingit First Nation (TRTFN). Atlin is located in northwestern BC, 200 km south of the Yukon border. Prior to the 2009 development of the wholly owned TRTFN micro-hydro project, Atlin was served by a BC Hydro diesel generating station. Atlin and the TRTFN's success is well document, and Peter Kirby, project manager and President of Atlin Tlingit Development Corp., has spent time engaging with and mentoring other remote communities participating in energy development projects. Many of the barriers discussed in this interview were those that Kirby encountered through the Atlin project as well as those he has observed in his role helping other communities.

⁶ With the exception of the community of Atlin, whose representative, Peter Kirby, is very active in the provincial RCE scene. Mr. Kirby is often asked to speak on the subject of community energy development and his views have been expressed publicly on several previous occasions.

Technology		N/A
Financial	Access to financing	Difficulty qualifying for financing from lending institutions.
Institutional	Timelines and flexibility	Complexity of working in remote environments leads to delays, and requires that timelines of funding arrangements be flexible.
Community Resources	Project champion	Community champions necessary to navigate community and staff through project development process.
	Priorities	Leadership must prioritize development – long timelines in project development require commitment
	Personnel Resources	Many stages of energy planning require significant capacity, including contract negotiation
Other	Knowledge sharing	Lack of knowledge and capacity sharing among communities for common project elements

3.6.2 HARTLEY BAY

Hartley Bay is a community of 170 residents, located on the Northwest Coast of the Province. Since having a community energy plan completed in 2003, Hartley Bay has set the goal of becoming the “greenest First Nations village in Canada.” They will do so by offsetting the 2GWhr/year of diesel energy consumed in the community with a community-owned small hydro project.

Technology		N/A
Financial		N/A
Institutional	Timelines and flexibility	Unique community situations require flexibility from the institutions they work with.
	Fragmented policy approach	<ul style="list-style-type: none"> • Disparate and numerous application and reporting requirements for grants • Conflicting institutional priorities and expectations leads to delays • Work with BC Hydro split between two departments: negotiate EPA and RCE program • Onerous permitting and regulatory requirements, compounded by instances of Federal/Provincial overlap
Community Resources	Project Champion	Community is very reliant on one individual for project
	Personnel Resources	<ul style="list-style-type: none"> • Steep learning curve • Insufficient funding for community capacity development • Insufficient knowledge-sharing from communities that have experience with energy development to those that are undertaking developments
Other	FN Rights	Conflicts over ownership of water rights for waterways on First Nation territory.

3.6.3 HESQUIAHT FIRST NATION

Hesquiaht First Nation is located on the Northwest coast of Vancouver Island. The community of approximately 25 families is powered primarily with diesel that is either barged or flown in. The Hesquiaht have set the dual goals of energy autonomy and generating 100% of their energy needs with renewable power by 2016. To do so, the community is working towards developing a mix of wind, small hydro and biomass energy.

Technology		N/A
Financial		N/A
Institutional	Timelines and flexibility	Programs lien on one another; long and unpredictable timelines can undermine stability of financing.
	Priorities & Resources	AANDC staff does not have the resources to deal with the number of projects proposed by Canada's First Nations.
	Priorities	Conflicting utility priorities: acquiring power for sale and developing power for off-grid communities.
Community Resources	Personnel resources	Lack of administrative support across jurisdictions to assist with complex development process.
Other	Encouragement	No process exists to support good projects that have been proposed, but are not granted funding (ie, to encourage communities to follow-through with projects).

3.6.4 SEYMOUR ARM

Located at the North end of Shuswap Lake, Seymour Arm's residents – approximately 60 live there year-round – are each responsible for generating their own power. The community association is working with BC Hydro's RCE program to develop a centralized power source.

Seymour Arm is in the early stages of project development and is anticipating a report and recommendation from BC Hydro on the community's resource options. BC Hydro's recommendations will be presented to the community as a referendum question on whether to accept the recommendations and take on the cost of providing the infrastructure for the power.

Technology	Inadequate resources	Limited natural resources to accommodate renewable option: no wind, no agriculture for biomass and nearby stream is salmon bearing.
Financial	Cost	Too costly to build substation and deliver electricity to community from nearby transmission that runs from the Mica damn.
Institutional		N/A
Community Resources		N/A
Other		N/A

3.6.5 ST'AT'IMC FIRST NATION

The St'at'imc nation, who have four communities in Southwestern BC, on (or near) north Harrison Lake were connected to the Province's main grid in November 2010. Prior to connecting to the grid, the communities' 330 residents relied on diesel to meet their power needs. The St'at'imc have been involved in grievance negotiations with BC Hydro since 1993 over historic grievances relating to the construction of BC Hydro's Bridge River system in St'at'imc traditional territory.

Technology		N/A
Financial	Cost	Costs have been too high for utility to consider building substations to divert hydro from overhead transmission to communities.
Institutional	Relationship	Historical grievances with utility
Community Resources	Personnel Resources	Committed and competent staff necessary to get through intensive negotiation process.
Other		N/A

3.6.6 TOAD RIVER

Toad River is located in the Province's north, about 200km south of the Yukon Border. Prior to the community's involvement in BC Hydro's RCE program, Toad River's 60 residents were each responsible for meeting their own power needs. In 2009, BC Hydro centralized generation with the installation of a diesel generator.

Technology	Familiarity	Community was more familiar diesel (many community members use diesel generators to power their own homes) than wind and micro hydro options.
	Maintenance	Confident that if problem arose with diesel generator the fix would come from nearest town 2 hrs away. Were not confident same would be true with alternative.
Financial	Cost	Diesel was the least expensive option that the community was presented with.
Institutional		N/A
Community Resources	Personnel Resource & Community Champion	Timelines factored into community decision – diesel was seen as simpler and timelier solution to the community needs.
Other		N/A

3.6.7 TSAWATAINEUK

Tsawataineuk is located north of Vancouver Island in the Haida Strait. The community's 90 residents rely on four diesel generators located on the opposite side of the Kingcome inlet. The diesel is barged up the Kingcome River, and then trucked to the generators. Overall, the goal of the community is to be free of diesel power, and to retain some ownership of the new power source. The Tsawataineuk are in the very early stages of examining potential resource options.

Technology		N/A
Financial	Cost	Historically (early '90s), cost of diesel was not high enough to attract institutional support for community micro hydroproject proposals
Institutional		N/A
Community Resources	Personnel	<ul style="list-style-type: none"> Community has many power options available; requires considerable confidence and capacity from staff to evaluate.
	Priorities	Have not had input from community to date, therefore do not have a grasp on community wishes.
Other		N/A

3.7 SUMMARY OF RESEARCH

British Columbia's remote communities are each unique, differing in size, population, wealth and leadership; this sample is no different. The issues revealed in the seven interviews present a snapshot of challenges inherent to developing alternative energy in British Columbia's remote communities. Together with insights gained from the literature the most relevant challenges become evident.

As previously mentioned, great care has been taken to maintain discretion when highlighting interview results. Due to the nature of the research, communities were placed in the awkward position of being asked to comment – in some instances critically – on the programs and institutions upon which they rely. It is important that my discussion of the interviews does not undermine the relationships that are necessary for community energy projects to move forward. Because each community circumstance is unique, many anecdotes and comments cannot be shared. As a result, the discussion that follows is brief and at a very high-level; however I hope it provides sufficient insight into the challenges communities encounter in working to meet their energy goals.

The challenges discussed by communities fell broadly into two categories: those that are community and site specific and those that were more broadly experienced.

3.7.1 SITE-SPECIFIC BARRIERS

Site-specific issues, such as lack of renewable resources, the presence of land-contamination or the need for extraordinary approvals due to unique environmental features affected many of the communities. However, each challenge was the consequence of the community's unique circumstances.

The community of Seymour Arm, for instance, is in an area with no possibility for wind power and very few biomass opportunities. The river that has energy generating potential is salmon bearing and unlikely to accommodate a hydro project without jeopardizing the protected habitat. BC Hydro was to present the community with different options for generation in the summer of 2012 – the interviewee suspected diesel might be their only feasible option.

Other communities faced complex challenges with stakeholders – mainly governments and the utility - because of extraordinary or historical circumstances. The communities that make up the Douglas First Nation settled a decades old historical grievance with BC Hydro to have power brought to their community from the transmission line that traverses their land.

Costly and time consuming additional environmental approvals were required for multiple communities because of unique environmental features at the proposed development sites.

Site specific challenges are bound to come up when communities (of any size) undertake large infrastructure projects. These issues are difficult to address on anything but a case by case basis. On the other hand, there were several issues that I consider to more “broad based” challenges that can be addressed through policy reforms.

3.7.2 BROADLY EXPERIENCED BARRIERS

There are several issues that were more broadly experienced. Most notably, communities expressed frustrations with the lack of flexibility and community resources required by the programs that they rely upon. And, unsurprisingly for such small communities, retaining adequate numbers of qualified personnel (including an individual to champion the project) is a challenge.

The number of programs that communities have available to them is highlighted in **Table 1**. For the most part, these programs are delivered in the form of grants and contributions. Although communities expressed appreciation for these programs – they would not be able to develop projects without them – there was definitely some frustration from interviewees with how they are currently delivered.

For the most part, interviewees have very small staffs (anywhere from 1 or 2 to 10 team members) and a lot of time is spent keeping track of grant timelines (annual application deadlines, what part of project development the grant covers, etc). An even greater amount of community resources are expended applying for and reporting on grants that have very different sets of requirements. Furthermore, in some instances project funding is contingent on funding from another source. (Communities are frequently required to demonstrate that their project has been approved for funding from other programs, or that they are able to leverage grants to secure other sources of funding). This becomes

very problematic when organizations fall behind processing applications, granting approvals and releasing funds. AANDC is notorious for causing delays; and because they're often a key contributor, this can have a ripple effect on communities' project development plans.

In remote areas – where the construction season may be severely limited by weather and access – delays can have a detrimental impact on project development. It is for this reason that interviewees felt that strict timelines for granted funds (that is, funds must be spent within a certain time period) should be relaxed to accommodate challenges specific to remote areas.

The message from communities was fairly unified: grants should be better coordinated, more flexible and require fewer community resources to apply for and report on.

The limited number of personnel that communities have available to draw on was also a challenge. Those that are further along or have completed the process of project development – Hartley Bay, Atlin, Douglas First Nations, for example – each have strong “community champions”. Community champions are individuals that not only advocate on behalf of the project (to ensure it remains a priority for local councils and the community's citizens), they also bear much of the responsibility for managing the project and navigating through the steps required to complete it. For private power producers, several directors may share the responsibility that one community champion bears in a small community. This is obviously a challenge; the long timeline of projects increases the likelihood of burnout for these individuals. I suspect that many of the communities that have not engaged with BC Hydro to date do not have an individual available to take on this role.

Champions are often the main figure to bridge between the community and external supports (BC Hydro, Governments, lending institutions, contractors and consultants). However they are also assisted by key staff. As one interviewee put it, the people that work in small communities are often required to wear “many hats” as limited staff is stretched to manage all aspects of community management and development.

For some communities, finding adequately trained staff can be a serious challenge. In many areas this may be the largest or most complex project that has been undertaken. The skills required to evaluate and administer large contracts does not necessarily exist

within the community. Nor is there the expertise to negotiate financing terms with lending institutions, electricity purchasing agreements with BC Hydro, or procurement contracts with suppliers.

Personnel resources, like those outlined above, were a challenge for all of the communities that opted to take the lead in developing their project. The two communities where BC Hydro took (or has taken) the lead in project development – Toad River and Seymour Arm⁷ (also the only non- FN communities interviewed) – did not face the same challenges because BC Hydro staff take on much of the responsibility.

Many interviewees view the delivery of the RCE program as well as the supporting provincial and federal initiatives as a window of opportunity to spur economic development and create jobs within their communities. (See **Table 2** for a list of some of the perceived benefits to community owned project development). However, it is a challenge for communities to realize these benefits with the availability and level of training and expertise that exists within the communities.

The following chart highlights the conclusions drawn from the literature as well as those that emerged through the interviews with each community. The shades of gray in the chart distinguish between barriers identified in the literature and those identified by the communities – the darker gray is community results.

⁷ Seymour Arm had not decided whether to develop the project themselves or have BC Hydro take on project development (the community was still learning about resource options at the time of research).

TABLE 5: UNDERSTANDING WHERE BARRIERS OVERLAP

<i>Barriers identified in domestic and international literature as well as community interviews:</i>	Int'l Lit.	Domestic Lit.	Atlin	Hartley Bay	Hesquiaht FN	Seymour Arm	St-at-imec FN	Toad River	Tsawataineuk
Technical									
Familiarity									
Resource Data									
Presence of Resource									
Financial									
Cost							*		*
Access to Financing									
Incentives									
Institutional									
Fragmented approach									
Timelines & Flexibility									
Priorities									
Relationships									
Community									
Project Champion									
Personnel Resources									
Priorities									

* historical issue

Barriers identified by interviewees:



Barriers identified from literature:



3.7.3 RESEARCH RESULTS: WHERE INTERVIEWS DIVERGED FROM THE LITERATURE

Interestingly, feedback from interviewees diverged from the challenges most frequently highlighted in the literature.

I have visually highlighted this in the **Table 5**, where community barriers are identified in a darker gray than those that were cited in the literature.

Technical and Financial barriers were not mentioned by interviewees as frequently as one would expect, given their prominence in the literature. Specifically, familiarity with alternative energy; cost of projects and access to financing – were mentioned by only a few communities. Cost of projects was identified as a barrier by over half of the communities, however for two of the four, cost was an historical issue that was no longer seen as a barrier to development.

I suspect there are two reasons why technical and financial issues did not factor in for the communities that participated in this research. First, British Columbia is a province powered almost entirely with renewable resources. This includes small-hydro projects, large-hydro projects, biomass facilities, waste-to-energy facilities and wind projects. Many of these projects were built by private developers and some were built in remote areas. All of this to say, British Columbians are likely more familiar with, and accordingly, more comfortable with renewable energy technologies than perhaps literature from other regions would suggest.

The second reason for the distinct results is the financial support that communities receive for alternative energy projects (these supports come mainly in the form of grants and contributions and were highlighted in Table2) combined with the high cost of delivering diesel power to remote areas

Where interview results really deviated from the literature was in the challenges communities encountered when dealing with provincial, national and non-government organizations. Interviewees rely on a number of programs. The ad-hoc institutional framework is unique to British Columbia and it is particularly complex for First Nations communities. There are certainly similarities in other provinces (the fragmented policy approach is highlighted in the domestic literature), but, I believe the reason for the predominance of this issue in interviews, and its absence in the literature, is due to the uniquely domestic context. The lack of coordination among these programs draws excessively on community resources that are already stretched. The lack of flexibility – especially around timelines – can undermine the stability of financial arrangements and create perverse incentives as many grants require expenses be claimed within a specific period, compelling communities faced with project delays (a common issue in remote areas) to imprudently spend the remainder of their grant money.

Finally, it is notable that both the domestic literature and interviewees cited personnel resources and the need for a dedicated community champion as challenges. This is a challenge in small communities everywhere; working through the stages of community energy planning and project development is complex, time consuming and requires confident community members; without them it is very difficult for projects to move forward.

4. IDENTIFYING POLICY DIRECTIONS

Challenges that communities must overcome when planning energy development projects have been outlined in the preceding pages. For simplicity, barriers were grouped into four categories: technical, financial, institutional and community resources. Each area demands consideration for how best, or even if, the existing energy development process can be modified or improved to assist communities in overcoming these challenges. However, two stand out because of their relevance to the communities interviewed, and their noted presence in both domestic and international literature:

1. The patchwork of programs targeted to RCE development
2. The lack of personnel resources in communities to manage the complex development process.

The capacity of communities and complexity of development process have been identified as the two areas where progress can be made. This does not discount challenges communities encounter acquiring financing or understanding new technologies, but it does point to the domino effect that inadequate community resources and complex institutional frameworks have on other aspects of energy development. A community's success in examining and deciding upon generating options presented in community energy plans, in qualifying for and negotiating favourable financing agreements, or in negotiating with private power producers, contractors, or the provincial utility are highly dependent on the skills and capacity of individuals within the community.

The complexity of the existing remote community institutional framework and the dearth of capacity in the communities they are targeted towards are issues that clearly compound one another. They are also challenges that affect communities' abilities to deal with other barriers identified in the interviews – accessing sustainable financing and understanding changing technologies are two clear examples. The policies presented below will focus on the areas underpinning the challenges to remote community energy development by simplifying existing programs, facilitating communities' access to programs as they move through the development process and by equipping communities to handle project development effectively and autonomously. I examine below the policy directions that may help to ameliorate these challenges. As noted in the introduction, they are grouped into three categories: simplify, facilitate, equip.

4.1 OPTION 1: SIMPLIFY

Both the Federal and Provincial governments support remote community energy development through a number of departments and programs. In addition, several provincial non-government organizations also have initiatives targeting remote communities to support energy initiatives.

One of the most substantial and consistent ways that these organizations offer support is through grants. Indeed, for many institutions, their sole involvement in RET development is through the provision of grants. In delivering grants, these organizations also offer assistance in qualifying for and developing applications and also in meeting reporting requirements once the grants have been awarded; however, the main thrust of their involvement is financial support.

Many facets to energy infrastructure development are necessarily complex; these include the negotiation of contracts and financing as well as environmental assessments and permitting. However, some components of project development are *unnecessarily* complex; for remote communities; these include the well-intentioned but onerous grant application processes for which they are eligible.

Although the provincial renewable energy sector is relatively small – even more select when dealing specifically with remote communities – for the most part, programs targeted to remote communities run independently of one another.

Simplifying and harmonizing the grants targeted to remote community energy development would allow communities to focus their scarce resources (time and personnel) on moving their community projects forward.

4.1.1 POLICY: SIMPLIFY GRANTING PROCESS

Objective: The objective of this initiative is to decrease the resources communities must expend to qualify for and maintain grants, and to ensure that existing grants are

appropriately targeted and flexible enough to meet community needs.⁸ This may be achieved by undertaking the following coordinated initiative:

- RCE Network led voluntary initiative for granting institutions to opt into a working group tasked with reviewing the existing grant programs targeted to remote community energy development.
- Network should work toward developing a set of consistent and ideally, uniform, standards and timelines for grants so that communities are not expending unnecessary resources catering to unique application and reporting requirements.
- If this proposal is to be effective, the option requires coordination among governments as well as NGOs in order to establish mutually agreeable granting guidelines.

4.2 OPTION 2: FACILITATE

The institutions that exist to support clean energy development have vastly more experience at the outset of project development than the communities they are tasked to assist. This is because, while it is likely to be the community's first look into large-scale energy infrastructure development, the institutions they are interacting with have been participating in remote community clean energy development projects for years. The individuals in these organizations are a valuable resource for communities undertaking alternative energy development; the only greater resource is individuals from small communities who have succeeded in their own community energy development goals. Creating strong linkages between communities pursuing energy development and those that have successfully negotiated the difficult processes gives communities the resources to undertake project development with greater confidence.

⁸ A proposal to pool grants was considered by the RCE Network several years ago, but did not gain sufficient support from the necessary organizations. There was, allegedly, not much willingness on the part of granting institutions to give up the autonomy of their funding decisions. (Understandably, organizations were also reluctant to hand over the responsibility of reviewing applications and reports because there are staffed positions associated with this work). The proposal to pool grants is notable in that it tacitly acknowledges that the existing set of initiatives is complex and burdensome the way they are currently administered.

Currently, the path to energy development is largely self-directed. Communities work their way through community energy planning, feasibility studies, project proposals and development on their own. As mentioned above, there is certainly support from some organizations – BC Hydro’s remote community electrification program will take a strong lead for communities that are willing to work with the utility and to give up some their autonomy; the Ministry of Energy’s Remote Communities “Program staff will work with communities to access support, expertise and matching funding for community energy solutions.” (MEM, 2008)

BC Hydro is engaged with eighteen communities through its RCE program. There are approximately ten more provincial communities that meet the requirements for participation in the RCE program. The MEM’s Alternative Energy Branch, under which the RCCEP is run, has four staff members. In addition to the RCCEP these staff members are responsible for “advancing energy efficiency policies and programs, development and deployment of leading edge clean energy technologies, and advancing community-based energy policy and programs for the benefit of all British Columbians” (MEM, 2012). The Ministry’s small staff is unable to provide the degree of on-going support many communities require.

The Fraser Basin Council has identified communities’ need for access to outside resources and co-ordinates a community-to-community mentorship program “to assist remote BC communities that are new to the development of energy efficiency and clean energy projects.” The mentorship is “with a community that is already experienced in energy efficiency or clean energy projects, [and] can contribute to the overall success of a community project by increasing local knowledge, enhancing confidence and developing a support network” (FBC, 2012).

Currently, the program relies on two key mentors who have earned a great deal of respect for the work done in their own communities, and whose expertise has been highly valued by several of the communities interviewed for this project. However, the mentors, and the communities they are tasked to assist, both identified the disparity between the needs of communities and the ability of FBC’s fledgling mentorship program to provide the needed support and direction.

4.2.1 POLICY: SINGLE POINT OF CONTACT & EXPANDED MENTORSHIP PROGRAM

Objective: The objective of this program is to provide adequate resources to communities to guide them through the energy development process and to promote knowledge-sharing by facilitating community access to individuals with experience in remote community energy development. The following initiatives are proposed to achieve this objective:

- Expand the staff and mandate of the Ministry of Energy's Remote Community Energy Program to enable them to work with communities from beginning stages of project feasibility and assessment through to completion.
- Expand existing mentorship program by bringing more successful project developers into mentorship roles; recruit mentors from communities that have successfully developed projects as well as from the NGO and business community that are involved in energy development. Private sector and NGO mentors should hold expertise in the many stages of project development.

4.3 OPTION 3: EQUIP

It is evident that complex infrastructure development projects stretch the limited resources of small communities and have the potential to overwhelm their personnel. UBC's Sauder School of business developed the *First Nations Energy Road Map* in February 2011. Although the publication is targeted to First Nations it is relevant to all of province's remote communities. The guide is divided into four sections covering four stages of project development. This framework is not only a valuable resource for communities, but also a clear way of understanding the stages of project development that require skills, and competencies that are required within small communities.

These 4 stages offer a structure around which to develop community workshops:

1. Developing an energy profile
2. Creating an energy plan
3. Implementing an energy plan
4. Managing energy infrastructure

Within each of these stages are several steps that communities must undertake. For the most part, communities navigate these stages independently, hiring consultants, consulting with the utility, negotiating contracts with developers, contractors and financiers, etc. These processes require tremendous time and effort not to mention confidence and skills. Having access to workshops and course materials can give

members of small remote communities the confidence and skills to assume these tasks and work through the energy development process. The need for additional capacity building resources in remote communities is well understood. Communities have access to a number of programs that fund workshops and a train certain skill sets (applying for grants, for instance). The BC Rural Network's Learning Initiatives for Northern Communities (LIRN) is particularly relevant. LIRN provides some funding and support (through curriculum development and workshop facilitation) rural, remote and northern communities to develop workshops on locally significant issues. Over the past seven years 80 communities have participated in LIRN's program. What is laid out below, is a proposal to formalize and intensify the role of LIRN, by asking it to deliver (rather than support) curriculum-based, intensive programming specific to economic development and community planning.

4.3.1 POLICY: INFRASTRUCTURE DEVELOPMENT TRAINING

Objective: The objective of this multi-year pilot initiative is to equip remote communities with the skills to develop community infrastructure projects, and to prepare remote communities as they work through the energy process. The following lays out a proposal to scale-up LIRN's role in the delivery of skill-building programming in remote communities.

- This is a proposal for a five-year pilot program that builds on the work being done by BC's Rural Network's (BCRN) Learning Initiatives for Rural and Northern BC (LIRN BC).
- The main program is a suite of intensive curriculum based workshops covering areas generalized to all types of infrastructure development: grant application; contract administration; negotiations etc. to be delivered in a centralized location and on-line.
- Educational materials should be delivered through multiple mediums: online webinars as well as published resources. This is particularly relevant for learning initiatives specific to RCE process.
- Initiatives specific to RCE process should act as a guide for communities and be responsive to community needs. Integration with mentorship program as well as MEM.

- Full funding from the Province is necessary for workshop development and delivery as well as associated materials and report development. And partial cost coverage is essential to ensure community participation.

5. EVALUATING OPTIONS

Each of the suggested proposals targets different aspects of the most common challenges communities face. **Simplify** is intended to streamline the fractured set of programs communities rely upon; **Facilitate** lessens the burden borne by community champions to navigate the RCE process and builds a network of support; **Equip** provides opportunity to acquire skills that may not exist within the community, or to improve upon what is already there. These programs are not mutually exclusive, rather they build on one another. There are strengths and weaknesses to the proposals and the following evaluation is intended to highlight those.

The ultimate goal of proposals is to mitigate barriers and improve the success rate of communities seeking to move toward clean power generation. The criteria selected to evaluate the policies reflect this goal by focusing on the ease with which the policies can be implemented, and how the target communities will receive the policies. Again, the evaluation is not an absolute measure of one policy versus another; it is solely intended to highlight the strengths and weaknesses of the proposals.

The policies will be evaluated on the following criteria:

- Feasibility
- Community Acceptability

5.1 FEASIBILITY

The degree to which the proposals are feasible will be measures using three categories: coordinate, mandate, resources, which are defined in table 6, below. The alternative should receive enough support from relevant actors within government to ensure successful implementation. The proposal should be simple enough to be easily implemented and taken up by the targeted communities. Although not handled explicitly, the costs of the measures are captured in this criterion as the need for additional resources, including staffing and programming requirements is evaluated.

The degree to which the proposal is feasible is based on the three criteria listed below:

TABLE 6 - BREAKDOWN OF FEASIBILITY

Criterion	Definition	Measure	Metric
1. Coordination	Does the policy require inter-jurisdictional cooperation?	Must coordination occur among the three tiers of program providers (Federal, Provincial, NGO) in order for the proposal to be successful?	Score 0-2
2. Mandate ⁹	Does the policy fall within a particular agency's mandate?	Does the objective of the policy fall within the mandate of an agency currently delivering services to remote communities?	Score 0-2
3. Resources	Does the capacity to implement the policy exist within relevant agencies?	Is there enough staff and do they have the appropriate training to be able to administer the proposal?	Score 0-2

1. **COORDINATE:** Must coordination occur among the three tiers of program providers (Federal, Provincial, NGO) in order for the proposal to be successful?

Score

- 0 = The proposal requires significant co-operation between program providers to be effective
- 1 = The proposal requires support from one or more program providers
- 2 = Program can be implemented effectively without coordination

Simplify: Although the RCE Network-led initiative is voluntary, to be most effective it requires significant co-ordination between Provincial and Federal governments (and multiple departments within government) as well as pulling in NGO and First Nations organizations that deliver grants to remote communities. Without the willingness of these multiple groups to participate in this initiative, this proposal will fail to meet its objective of reducing the resources communities must expend to qualify for, and maintain, grants and to ensure the best possible coverage for existing grants. **Score: 0**

Facilitate: There are two components of this proposal: single point of contact and expanded mentorship program. The provincial government funds the mentorship

⁹ Mandate, as it is defined here, is assumed to capture the more common criteria “stakeholder acceptability”. If the proposal falls within the agencies mandate *and* it receives adequate funding to implement the policy, there is no reason to believe that the relevant organization would not be supportive. In my view, it would be redundant to have a second measure of whether the policy would be viewed favourably by the organization tasked with implementing it.

program, which is run by Fraser Basin Council. In order to be successfully expanded it will require additional provincial support. Still, it does not need significant coordination with external organizations be effective. Similarly, if MEMPR's RCE program staff were to become a single point of contact to guide communities through the development process, support from program providers will facilitate the success of the initiative. (Full coordination is not necessary for the program to operate effectively.) **Score: 1**

Equip: The proposal prescribes the development of a new initiative within an existing organization – the BC Rural Network. The BCRN receives funding from a number of sources, primarily the province, and is operated by the Fraser Basin Council. Similar to the proposal to **Facilitate**, in order to be successful this program will require additional financial support. It does not *need* to coordinate significantly with external organizations be effective, but it would *benefit* from coordination. **Score: 1**

2. MANDATE: Does the objective of the policy fall within the mandate of an agency currently delivering services to remote communities?

Score

0 = The objective of the proposal does not fall into the mandate of any relevant agency

1 = The proposal falls directly within the mandate of a peripheral service provider or roughly within the mandate of a core service provider

2 = The proposal falls directly under the mandate of a core service provider

Simplify: The mandate of the RCE Network is to “assist BC remote communities in implementing community energy solutions by coordinating access to network member’ programs.” The ‘Network’ is currently MEMPR, AANDC, BC Hydro and First Nations Technology Council. Although these organizations form the core of groups that communities access for RCE funding and assistance, a number of other organizations offer initiatives that would not be considered “network member’s programs.” In order for this proposal to fall directly within the mandate of the RCE Network, either the mandate or the Network must be broadened to encompass other organizations involved in RCE development. **Score: 1**

Facilitate: The MEM’s mandate is to “work with communities to access support, expertise and matching funding for community energy solutions,” and the proposal to

provide a single point of contact for communities simply expands this role. Furthermore, the FBC's RCI program's objective is to "to assist remote BC communities that are new to the development of energy efficiency and clean energy projects," and they are currently coordinating some mentorship between communities. **Score: 2**

Equip: The BCRN's mandate is to "enhance the capacity of rural British Columbia to develop responses to rural and remote community issues" by "acting as a coordinating body for the dissemination of information, tools, and resources of importance to rural and remote communities in British Columbia" and "acting as a catalyst to build linkages between communities, rural organizations, and policy-makers who work on issues of importance to rural and remote communities in British Columbia" (BCRN TOR, 2006).

Score: 2

3. RESOURCES: Is there enough staff and do they have the appropriate training to be able to administer the proposal? Is additional programming and planning required to implement the proposal?

Score

0 = Capacity does not exist – the agency will have to hire new staff and develop new programming

1 = Capacity exists within the agency, but more staff is needed for the initiative to be effective

2 = Staff are sufficient in number and are sufficiently equipped to implement the policy

Simplify: This proposal requires that existing staff, familiar with their own granting guidelines, come together from a multiplicity of organization to work together to harmonize grants. It does not require that new staff be hired for the policy to succeed.

Score: 2

Facilitate: Staff with the RCE program and FBC are involved in initiatives largely congruent with the ones proposed. However, both the expansion of the mentorship program and elevating the role of MEMPR's RCE program require additional staffing resources in order to be scaled up while remaining effective. **Score: 1**

Equip: The Learning initiatives for Rural and Northern BC (LIRN BC) is the most relevant initiative within BCRN that this proposal would work under; it delivers workshops

in BC’s remote communities. However, LIRN BC requires communities in which the workshops take place to develop, and for the most part, deliver the programs. LIRN BC’s predominant role is in financing workshops and providing support for their administration. Developing and delivering curriculum based educational workshops would require LIRN BC (and by extension, BCRN) to take on additional capacity. **Score: 0**

5.1.1 SUMMARY OF FEASIBILITY EVALUATION

The preceding section evaluates the feasibility of each of the three proposals based on the criteria laid out in Table 6. The following is a table summarizing the scores each policy received for each respective measure and is followed by brief points highlighting key issues that affect the feasibility of the proposals.

Criterion		SIMPLIFY	FACILITATE	EQUIP
1. Coordinate	Does the policy require inter-jurisdictional cooperation?	0	1	1
2. Mandate	Does the policy fall within a particular agencies mandate?	1	2	2
3. Resources	Does the capacity to implement the policy exist within relevant agencies?	2	1	0

- All policies fall roughly within the mandate of existing agencies. However, two of these agencies – FBC and BCRN (which is run by FBC) – are supported by the provincial government and would require additional support for proposals to be implemented.
- **Simplify** works within existing organizations and with existing staff; however, it is far from certain whether the RCE Network would be able to successfully negotiate common application and reporting requirements with a meaningful number of granting institutions for the proposal to successfully meet its objectives.
- **Simplifying** existing programs and **facilitating** communities as they work through the energy development process are both proposals that work within existing programs. **Equipping** communities, on the other hand, is a proposal for a new initiative within an existing institution, and therefore requires additional

staffing, training and program development for BCRN to implement the policy successfully.

5.2 COMMUNITY ACCEPTABILITY

The alternative should be acceptable to the targeted communities and not contribute to the existing burden of project development. Three categories are used to measure the community acceptability of the proposals: time, cost, and support. The criterion are defined in **Table 7** below.

TABLE 7 - BREAKDOWN OF COMMUNITY ACCEPTIBILITY

Criterion	Definition	Measure	Metric
1. Time	Does the policy require additional time commitment from the community?	In order for the policy to be effective, must staff from the community dedicate time to the program?	Score 0-2
2. Cost	Does the policy require additional financial commitment from the community?	In order for the policy to be effective, must the community expend money (in addition to staff time measured above)?	Score 0-2
3. Support	Are the communities likely to be supportive of the measure?	Does the proposal meet a need expressed by communities?	Score 0-2

1. TIME: In order for the policy to be effective, must staff from the community dedicate time to the program?

Score

- 0 = Requires time commitment from community for policy to be effective
- 1 = Requires marginal time commitment from community, and may lessen overall time commitment if successful
- 2 = Does not require time commitment from community and may lessen overall time commitment if successful

Simplify: Aside from providing input, simplifying the existing grant structure does not require a time commitment from communities. Success of the policy will substantially lessen the time required by communities to access the funding needed to move through the energy development process. **Score: 2**

Facilitate: Interacting with a mentor and with a facilitator in the provincial Ministry of Energy requires a time commitment from the community. This time commitment is minimal, and the payoff in terms of time saved could be significant. **Score: 1**

Equip: In order for communities to truly benefit from the proposed educational workshops, the participants need to dedicate significant time. This is especially true if there is an evaluation component upon completion of the course. **Score: 0**

2. COST: In order for the policy to be effective, must the community expend money (in addition to staff time measured above)?

Score

- 0 = Requires financial commitment from community for policy to be effective
- 1 = Requires marginal financial commitment from community, and may lessen overall financial commitment if successful
- 2 = Does not require financial commitment from community and may lessen overall financial commitment if successful

Simplify: Streamlining grants will not cost the communities any money and may lead to more granting opportunities for the community. **Score: 2**

Facilitate: Networking with mentors and coordinating with ME is unlikely to occur in-person, and therefore will not require a financial commitment from the community.

Score: 2

Equip: Although most of the costs of the workshops will be covered, the cost of attendance will likely fall on the community. However, it is possible that on-line alternatives could also be offered to enable those interested (who have access to the internet) to attend. **Score: 1**

3. SUPPORT: Does the proposal address a need expressed by communities?

Score

0 = Proposal does not address a need expressed by communities

1 = Communities identified a need tangentially related to the initiative

2 = Communities identified a need directly related to the initiative

Simplify: Three of the seven communities expressed frustration with either the coverage of existing grants, or with the burden of applying and reporting to disparate and uncoordinated and frequently inflexible programs. This proposal explicitly addresses the above barriers by tailoring existing programs to meet community needs and limit their complexity. **Score: 2**

Facilitate: Three of the seven communities explicitly expressed a desire for expansion of the FBC mentorship program, and greater opportunity to connect with other remote communities pursuing energy development projects. Establishing MEM as a single point of contact to lead communities through the energy development process partially addresses the challenge of fragmented institutional approach. It also alleviates some of the burden taken on by the community champions and staff to navigate the energy development process. **Score 1.5**

Equip: For five of the seven communities finding and maintaining dedicated and qualified personnel was seen as essential to successful project development. This proposal indirectly addresses this issue by offering training programs and educational resources to build on some of the core skills required to work through the energy development process. **Score: 1**

5.2.1 SUMMARY OF COMMUNITY ACCEPTABILITY EVALUATION

The preceding section evaluates the degree to which each of the three proposals will be accepted by the target communities. The evaluations are based on the criteria laid out in Table 6. The scores each policy received in the evaluation are summarized in the following :

Criteria		SIMPLIFY	FACILITATE	EQUIP
1. Time	Does the policy require additional time commitment from the community?	2	1	0
2. Cost	Does the policy require additional financial commitment from the community?	2	2	1
3. Support	Are the communities likely to be supportive of the measure?	2	1.5	1

- The proposal to **streamline** grants will appeal to communities; it requires neither a time nor a financial commitment, and directly addresses one of the more complex and onerous aspects of project development.
- The time and financial commitment required from the community for the proposals to **Facilitate** is minimal, and it has the potential to minimize the total time communities spend navigating the energy development process.
- The proposal to **Equip** communities through the provision of educational material and workshops requires communities to engage with a *new* initiative and to dedicate significant time and effort in order to effectively address issues of training and skills within small communities.

5.4 OVERALL EVALUATION

The policy evaluation is intended to highlight the strengths and weaknesses of the three policies. The ultimate goal of proposals is to mitigate barriers and improve the success rate of communities seeking to move toward clean power generation. The criteria selected to evaluate the policies reflect this goal by focusing on two key issues:

1. The ease with which the policies can be implemented
2. Whether communities have demonstrated a need for and will participate in the proposals

The policies were evaluated on a scale of 0-2 for six criteria. This resulted in an overall scoring of the policies out of 12. The following table summarizes the evaluation:

TABLE 8: SUMMARY EVALUATION

	Simplify	Facilitate	Equip
Feasibility	3/6	4/6	3/6
Acceptability	6/6	4.5/6	2/6
Total	9	8.5	5

The above rating provides a snapshot of the how the policies compare to one another, but has the effect of minimizing both the strengths and weaknesses of the proposals. Breaking the evaluations down to a numerical score has the effect of giving the criteria equal weight and this may not be entirely appropriate. The success of *simplify*, for example, rests on the ability of the RCE Network to compel other organizations to participate in the initiative. This is captured by the evaluation of *inter-jurisdictional cooperation*, for which the proposal received the lowest score. However, this low score was more than offset by how favorably this policy would be viewed by target communities.

The following are some brief policy highlights to accompany the above chart:

- Simplifying existing programs requires organizations to form a working group and collaborate on ways to make their initiatives more user-friendly for the communities that rely upon them. Because the initiative requires no community resources, but its success is likely to very beneficial to them it received a perfect score for community acceptability. However, the success of this initiative relies on significant cooperation and ultimately compromise among granting intuitions and this is not assured.
- Expanding the mentorship program and elevating the role of MEM’s RCCEP staff to be the single point of contact for communities requires additional funding and personnel resources, but is effectively the expansion of existing initiatives that communities are familiar with.
- The development of curriculum-based workshops to assist community members tasked with taking on complex community development issues requires greater commitment, more financial and staffing resources and greater analysis to understand and meet community needs.

6. POLICY STRATEGY: INCREMENTAL IMPROVEMENTS

In the previous two sections I have outlined and evaluated the policy options in an order that reflects their increasing complexity of implementation (including the associated staffing and programming costs). I believe this is also the most sensible way to consider the implementation of the programs.

The proposal to **Simplify** is, in my opinion, a necessary undertaking. The organizations involved in RCE development are not blind to the imposition this number of programs places on the communities they are targeted to. This was not only clear in discussions with stakeholders, but is implicit in the earlier effort of the RCE Network to pool together some of the grants that are available to communities. The proposal to simplify requires organizations to begin an earnest conversation about how to reform the existing set of programs to better meet the needs of the communities they are targeted towards. This is a proposal that requires very few resources besides a willingness to cooperate and in my view is a low-hanging fruit in the effort to improve RCE outcomes.

Increasing staffing for the Ministry of Energy and Mines to provide greater assistance to communities undertaking their own energy projects requires greater investment, but builds on work that MEM is already doing. Similarly, increased funding to broaden the reach of FBC's mentorship program is a proposal that builds on existing programming. The proposal to **facilitate** communities through the energy development process is, at its most basic, a proposal to formalize and appropriately fund programming that is already assisting communities.

I do not think it's appropriate to recommend the full development and implementation of skill-building and training workshops targeted to RCE development at this time. BC Hydro's RCE program was originally proposed as a ten year initiative that is set to conclude in 2017. (Although I suspect, if communities continue to show interest and sign on to the program, it will be renewed.) Without program certainty I do not recommend implementing a costly, resource intensive multi-year program. That being said, the proposal, as it is laid out here, lends itself to all types of infrastructure development and could be beneficial to many rural and remote communities pursuing economic development and infrastructure projects not simply energy projects.

The following recommendations will facilitate more efficient navigation of remote communities through the energy development process:

1. The RCE network should immediately begin reaching out to other RCE programs and institutions. It is in communities' best interest for programs to be simplified, and their participation in the working group tasked with streamlining, harmonizing and reforming existing initiatives is necessary for that to occur.
2. Increase staffing levels at MEM's RCEEP to enable more active engagement with communities and increase funding for Fraser Basin Council. Further develop mentorship program by establishing a structure for community-mentor relationships and interactions. Expand program by recruiting additional mentors.
3. Use the feedback from MEM staff and mentors to develop a better understanding of gaps in community knowledge and skills. Use this feedback and consider the development of curriculum-based workshops to fill those gaps.

7. CONCLUSIONS

Not all communities will develop alternatives to diesel power. For some communities, the resources (either physical or community-based) may not exist or the costs may be too high. But, improvements to the existing policy framework can ensure that communities with development potential will have the support and tools to pursue energy solutions that are right for them.

Several programs provide financial resources to assist British Columbia's remote communities to achieve their energy development goals. Despite these initiatives, only a handful of communities have displaced their reliance on diesel with cleaner alternatives.

Feedback from interviews leads to the conclusion that the complex energy development process has the potential to overwhelm communities. Previous research demonstrates that this is especially relevant for remote areas with small populations whose personnel resources are limited.

Promoting clean energy development in remote communities is a priority for both the Provincial and Federal governments and considerable resources are being dedicated to realize this goal. The proposals outlined in this report complement existing initiatives through an incremental approach that builds on programs. The proposals provide the resources to help communities overcome challenges to energy development and move through the RCE process more efficiently.

Successful implementation of the policies proposed in this report, does not guarantee that more communities will adopt alternatives to diesel-powered energy. For the remaining thirty-plus communities that have yet to develop diesel alternatives, energy development may simply not be a community priority. More significantly, the personnel resources or the natural resources may not be adequate to support development. However, the recommendations in this study give communities that are considering their energy prospects the coordinated programs, access to experience and knowledge, and the accompanying confidence to undertake alternative energy project development.

8. ADDITIONAL CONSIDERATIONS

8.1 GREATER DIVERSITY OF INTERVIEWEES

Although communities representing various stages of RCE development were approached for interviews, I did not succeed in contacting a community that meets the eligibility criteria for RCE development but has not become involved in evaluating power options. There are approximately 16 communities in the province that fit this bill. Understanding what is preventing them from becoming involved in RCE development is important. With more time and more resources to reach additional communities, a greater breadth of experiences with RCE development could be incorporated into the recommendations of this report.

8.2 ROBUST COST ESTIMATE

The comparative analysis of the three proposals contained in this report would be greatly enhanced by a robust estimate of their costs. Without additional information on current funding and program costs for MEM, FBC and BC Rural Network, it is difficult to accurately estimate the degree to which additional funding is required for the proposals to be effective. Attempts were made to obtain financial reports from the three organizations whose programs the recommended proposals were based upon. However, the information that is publicly available is aggregated by the MEM (MEM provides the funding to FBC for the mentorship program) to cover all programs that are run under the alternative energy branch. Furthermore, representatives from the Ministry and FBC were not available to shed light on program costs before this report was published.

8.3 EXAMINATION OF SUCCESSFUL CAPACITY INITIATIVES ELSEWHERE

Both the recommendations to **Simplify** and **Facilitate** the existing RCE process are proposals that build on existing initiatives. However, the proposal to **Equip** communities and individuals through rigorous infrastructure development workshops is really a proposal for a new initiative to deal with the issue of lack of community capacity. “Community capacity” has become a bit of a buzzword, and is seen as a big barrier to economic development in rural, remote, and First Nation communities. Researching what is being done in other Canadian provinces (or other countries with similar challenges, e.g., Australia) – an evaluation of best practices for

enhancing community development skills and capacity – would provide more solid footing for the proposal made here.

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