

Renewable Energy Partnerships and Project Economics

Research supporting Indigenous–utility partnerships
and power purchase agreements

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Executive summary

Introduction and research goals

Remote Indigenous communities in Canada primarily rely on fossil fuels to generate heat and power. The majority of the electricity generation infrastructure in these communities is diesel-based, with emissions from the combustion of diesel fuel contributing to climate change, environmental degradation of land and water and health impacts. This prolonged reliance on diesel-based electricity also contributes to difficult economic conditions, social challenges and inequalities, which negatively affect personal and community well-being. There are various approaches to reduce or eliminate diesel use, typically including a combination of technical, financial, regulatory and policy solutions. Less examined but equally important strategies are enhancing collaboration and partnership, information sharing, and skill development among those responsible for implementing remote renewable energy systems. This research therefore focuses on the partnership dimension of renewable energy development. It does so by first exploring the relationships that drive renewables in remote communities and then by discussing the ways in which these connections can improve project economics. Of particular interest and focus in this research are the interactions between Indigenous power proponents and public / private electric utilities that currently dominate electricity provisioning in remote communities.

Indigenous power proponents are leading the way in bringing renewable energy projects to their communities and utilities are increasingly committed to seeing the development of renewable projects as well. However, little research has been done into how these parties are working together, what their collaborations have generated thus far and what major barriers remain. This research aims to better understand their dealings to date and the potential to improve and expand upon these early endeavours. The two main objectives of this research are to:

- examine existing and proposed arrangements between Indigenous power proponents and utilities with the goal of understanding and illuminating how these parties relate to each other and could improve working relationships to advance renewable energy projects.
- examine how Indigenous power proponents and utilities are thinking about and navigating difficult project economics with special attention to power purchase agreements.

Motivations

This work is motivated by the desire to understand and improve the relationship between Indigenous power proponents and utilities as well as the difficult project economics that slow the development of remote renewable energy projects. It aims to contribute to the well-being of Indigenous Peoples by paying special attention to the voices of Indigenous power proponents and the increased consideration Indigenous self-determination and the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) require. This focus is meant to counteract the prevailing motivations behind research on remote renewable energy projects that prioritize technology deployment over Indigenous struggles for self-determination. This research attempts to identify and promote opportunities for Indigenous leadership within the current colonial, market-based reality of energy development and utility authority in the North. While this approach is obviously imperfect and fraught, it nonetheless seeks to support Indigenous power proponents in their goals.

Research methods and scope

This research addresses renewable energy projects in remote communities, defined in this context as communities with microgrids that rely on diesel as the primary source of electricity. The research primarily examines the relationships between electric utilities (public and private) and Indigenous power proponents (often Indigenous governments or economic development corporations affiliated with Indigenous governments) but also considers the role of territorial governments. We explored these relationships using a qualitative research approach, relying on interviews with individuals representing Indigenous power proponents, utilities, and territorial governments. We conducted interviews before, during, and after the Pembina Institute's 2017 Renewables in Remote Communities conference. We also convened a half-day session at this conference to hear from additional individuals. The findings in this report are based on 11 initial interviews, five-follow up interviews and information collected from the special session.

Due to finite resources, this report only discusses projects in the Yukon, Northwest Territories and Nunavut even though there are remote communities in Nunatsiavut and Nunavik as well as in most provinces. Additionally, our research specifically examines how Indigenous power proponents and utilities are collaborating to displace diesel electricity generation with renewable energy. We did not investigate the ways in which renewable energy projects might displace diesel for heating or transportation although these are crucial areas of study along with energy conservation and efficiency measures. Also, in focusing on distributed generation, we specifically asked research participants to comment on community- and utility-scale projects rather than net metering

programs. This research is focused on larger projects that require direct integration with the utility's diesel infrastructure.

Partnership highlights

Seven key considerations emerged from the discussions on partnerships: trust, engagement, open and transparent communication, project objectives, ownership, role of territorial governments, and federal investment. Three themes emerged as particularly important to the formation and maintenance of partnerships:

Trust – Trust is paramount in building successful relationships, but distrust in utilities is a significant barrier preventing the development of renewable energy partnerships. The lack of trust in utilities is rooted in the historical and ongoing impacts of colonialism, which continue to disadvantage Indigenous peoples. Within the context of partnerships, it can be difficult for Indigenous power proponents to establish equal footing with utilities because utilities wield a comparatively large amount of political, financial, and organizational power and these imbalances do not go unnoticed. This is true of both private and public utilities although participants noted different struggles in each case. According to participants, overarching and partnership-specific distrust has resulted in many missed opportunities and project inefficiencies. Participants suggested that utilities could better establish trust through open and transparent communication as well as more concerted efforts to engage with Indigenous governments, organizations, and communities.

Engagement – Indigenous power proponents and utilities are only just beginning to work together after years of separate investigations into potential renewable energy projects. These new connections are being welcomed by all parties but there is considerably more to do. Indigenous power proponents would like to see utilities adopt an even more proactive role in establishing good working relationships by initiating, maintaining and strengthening engagement. Utility representatives acknowledged that engagement is a new norm and there is much to learn. Indigenous power proponents suggested that utilities begin by asking about appropriate protocols to follow. Respectfully following the desires, acknowledging the aspirations and recognizing the inherent rights of Indigenous governments is an important first step in correcting the power dynamics that favour utilities. Sustained engagement of this kind could then lead to closer relationships where parties feel more at ease in seeking each other out and proposing joint opportunities.

Project objectives – Each party may have different motivations for exploring renewable energy projects; transparency and sharing of these objectives is extremely important to gain an appreciation for possible different goals and to navigate the complexities of relationship dynamics when motivations differ. Different priorities are often a reality; objectives do not necessarily need to align but this does not mean these circumstances cannot be successfully navigated. This sharing should be done at the onset of partnership exploration and continually revisited throughout; open communication around underlying motivations will help everyone involved gain an appreciation for respective objectives. Spending time and being transparent on main project objective can offer great insight and appreciation between parties and can go a long way on establishing a good working relationship.

Reflecting on the stories and perspectives shared, there are some successes to note but there are more challenges and barriers that must be overcome to advance meaningful partnerships for renewable energy projects. Successes include the growing interest and commitment on both sides — albeit in only some jurisdictions — in establishing sincere, successful partnerships where mutual objectives can be achieved. Indigenous power proponents are voicing more interest, initiative and determination to develop and bring renewable energy projects to their communities. Some utilities are beginning to respond by demonstrating increased receptivity towards partnering with Indigenous power proponents and acknowledging the value Indigenous involvement and partnerships can bring. Federal investments over the past two years have generated optimism and opportunity among those seeking to displace diesel and prompted various parties to examine partnership options. The main barriers are the distrust towards utilities, lack of transparent information sharing, and meaningful engagement. There is awareness to these factors and recognition that these issues go deep, informed by many years of colonial governance and control over Indigenous communities that will take much effort to improve.

Project economics highlights

Discussions on project economics identified key factors related to advancing business cases of projects — the role power purchase agreements (PPAs) play in project economics, the need for IPP policies to support PPAs, adequate PPA rates that reflect renewable energy transition and support good economics and finally, the entire regulatory regime governing utility action and setting PPA rates.

The role of PPAs in project economics

It is difficult to establish strong business cases for remote renewable energy projects against the artificially low-cost, highly subsidized diesel-based systems that dominate remote communities. Power purchase agreements (PPAs) are one way to support more favourable project economics. They do not guarantee a strong business alone but they have played an important role in attracting financing for Indigenous power projects elsewhere in Canada. PPAs are now gaining traction in the North as a small handful of Indigenous power proponents move forward in their negotiations with utilities.

Although not the primary financial mechanism supporting a strong business case, a long-term power purchase contract (through an established government IPP policy) backed by a fair power purchase rate is one enabling component to facilitate the growth of renewable energy projects. With a PPA contract in place, lender confidence and financing options will only improve.

IPP policy developments

IPP policies are slowly advancing in the territories. Yukon and Nunavut are moving in a similar direction toward a formal IPP policy in the past few years, with the NWT orienting more towards community-scale renewable energy guidelines. Yukon is close to passing legislation on their IPP policy and Nunavut, now having developed their net-metering policy, is looking towards designing an enabling IPP policy that will open up the opportunity for independent power development in the territory. As a whole and looking historically, progress on establishing IPP policies that open up the possibility of Indigenous power proponent opportunities is slow and cumbersome.

There are some interesting regional differences in current IPP approaches and the lack of details behind respective policies and slowness in bringing IPP policies to light have created a level of uncertainty and frustration for interested Indigenous power proponents. Specific differences in policy design include supporting third-party involvement in projects, the role (and perception) of privatization, and acceptable levels of profit in remote communities where electricity is highly subsidized. On privatization, there are a mixture of perceptions and fear that offering more IPP contracts will be seen as privatization of government-controlled electricity system (i.e. offloading responsibility) and that this privatization will lead to increased electricity rates. This is driven by the assumption that the profit that third parties would need to earn on a project can only be achieved by increasing electricity rates (even though this is not actually allowed under current legislative limitations without approval). The intertwined nature of privatization and profit is an interesting area to address.

PPA rates

On PPA rates, this research suggests that detailed negotiations on a fair PPA rate is one of the most challenging and time consuming aspects of negotiations and that there is not a clear understanding of what the term “fair PPA” constitutes. The research also indicates that the concept and terms *marginal* and *avoided cost* of energy are not fully understood and calculating the cost of energy varies and is complicated. Different approaches currently taken by territories exploring possible PPA contract scenarios (whether through an IPP policy or through community renewable guidelines) shows there is not a consistent approach to negotiating a PPA rate, where this rate falls on the marginal-avoided cost spectrum, whether the rate is considered fair and how to evaluate this. The negotiating process is hampered by the lack and transparency of data and utilities using the defense that overall electricity rates cannot increase and hence only low rates can be offered. Absent in PPA rate negotiations however is what effect subsidization has on marginal and avoided costs of electricity, what the true unsubsidized cost of electricity is and if and how subsidy savings from reducing diesel consumption can be shifted to renewable energy PPA rates. More work is required to advance the understanding and interplay of subsidies and increasing fair PPA rates.

Regulatory constraints

Finally, progress towards rates that take a more holistic approach in considering the effect of subsidies and the economic/social benefits that can be realized with a fair PPA rate is hindered by a significant barrier: regulations that govern utilities and electricity rates have an economic bottom-line focus that drives decision-making.

To find solutions to these complex challenges and to truly advance this area requires cooperation and leadership by utilities, regulatory bodies and their governments. They need to work together to adapt to the changing industry and to meet larger climate mitigation and greenhouse gas goals but they must share the responsibility of supporting Indigenous leadership and for advancing innovative regulations and regulatory processes that currently dictate economic-only analysis and ultimately obstruct progress.

Next steps

The top recommended next steps from this research are:

- **Support information sharing and relationship building** – Indigenous power proponents have recent rich experience negotiating and developing projects with utilities. Great benefit would be achieved if the details of these experiences are captured; for example, processes followed, principles that governed the relationship, barriers and roadblocks encountered, solutions found, lessons learned, contract negotiations and details on power purchase rate discussions. Considering jurisdictions in the territories are on the cusp of releasing new government IPP policies, a synthesis of lessons learned would be useful to draw parallels and further disseminate this important information. This information should also be integrated into existing training programs and other learning exchanges so stronger relationship can be built among all parties involved. Funding should be considered to support the involvement of Indigenous power proponents and communities in contributing and compiling this information.
- **Cultivate an ethos of engagement** – There is a clear message that the current engagement model used by utilities needs to transition to a deeper, more authentic and genuine approach — one that respects Indigenous culture, empathizes with the effects of colonial history and current colonial structures and power imbalances, honours and respects Indigenous rights and self-determination, is more transparent and is driven by the greater goal of building trust. Utilities must continue deepening engagement without their own preconceptions or agenda and respecting Indigenous engagement. Utilities are seen to be improving their engagement initiatives, but this new ethos of engagement is needed and this leadership needs to come from them.
- **Support knowledge creation and investigate emerging issues such as ownership** – With the novelty of remote renewable energy projects, the need is high for knowledge creation that serves the interest of Indigenous power proponents. By this, we mean collaborative research that helps Indigenous power proponents and utilities learn what they need to know in order to build better relations. This synthesis of information should tackle pressing questions and differences that are being noted across different jurisdictions. Ownership (equity vs physical asset ownership) and governance models are examples of issues that deserve more attention.
- **Get consensus on how to calculate the cost of energy** – All major actors involved in northern renewable energy development should work towards clarity

- and consensus on the terms used to describe the cost of energy – including the marginal cost of energy and the avoided cost of energy. These terms and the principles behind them are crucial to transforming discussions and can be used to better guide PPA negotiations. Having utilities be more transparent and provide evidence of their marginal cost of energy would be a helpful starting point.
- **Implement IPP policies and ensure Indigenous involvement** – Formalized IPP policies are forthcoming in the territories. Governments should continue working with Indigenous governments and organizations to ensure Indigenous involvement is prioritized in the process and that IPP policies are truly enabling and open up opportunities for Indigenous power proponents.
 - **Advance understanding of fair power prices** – Alignment is also needed in what constitutes a fair PPA rate considering marginal and avoided cost of energy, the possible net economic benefits of renewables that reduce diesel operating costs, a deeper understanding of diesel subsidies (the financial savings incurred from not paying subsidies when diesel fuel is not used) and the increased environmental and social benefits that could be incorporated into negotiated rates. This is a rich, complicated area of research that has the potential to significantly advance the deployment of renewable projects through the establishment of a well-understood framework, a common understanding of these terms and PPA negotiations that going beyond the *de facto* approach of PPA rates that hover around the marginal cost of energy and often do not progressively support a good business case for renewable energy projects.
 - **Research into regulatory innovation** – Regulatory innovation and new ways of thinking are required to break down the systemic economic-only, lowest-cost electricity ceiling in current regulations. Utilities, regulators and policy makers should brainstorm regulatory innovations to remove current constraints that prioritize economic decision making above all else. Not until there is a change in regulation or signal from government policy to support a new approach will this significant roadblock be addressed. This change, innovation and leadership must begin with utilities and their governments, who must work together instead of passing on their responsibilities. There are a few good examples in Canadian jurisdictions where these stakeholders have supported policy, mandated directives and pushed the envelope on how to advance renewables under rigid regulations. Reframing the role of the regulator from one of restricting rate increases to overseeing more prudent decision-making that encompasses not just economic decisions will help advance this.

Concluding thoughts

This work emphasizes the importance of mutually beneficial relationships between Indigenous power proponents and utilities and the role that PPAs can play in improving the business case of renewable energy projects in remote communities. With regards to partnerships, the barriers are clear: partnership and the opportunities for Indigenous inclusion are currently rooted in the colonial, market-based reality of energy development in the North, power imbalances between utilities and Indigenous power proponents (where utilities currently have the authoritative advantage) and lack of transparent information sharing. With regards to government policies and systems change, new IPP policies are required that enable Indigenous power proponents to build projects, and where PPA rates extend past marginal and avoided cost of energy and account for the needed restructuring of diesel subsidies. New approaches are needed that address all of these barriers — approaches that require not only cooperation among federal governments, territorial governments and their utilities, but also direct inclusion and contribution from Indigenous power proponents so their voices are heard, their knowledge appreciated and their leadership used.

We hope this research fosters an appreciation of some of the more human and financial challenges that impede the adoption of renewable energy projects in the North. Solutions to these complex challenges require cooperation by all, and especially acknowledgment from governments, regulators and their utilities that significant barriers exist that they have responsibility to address. This work also requires new innovative thinking that is driven by principles of Indigenous rights and self-determination, where the involvement of Indigenous power proponents needs to be considered a right and not a favour. Adopting renewable energy in remote Indigenous communities through sound government policy and leadership is a very relevant facet of improving federal nation-to-nation relationships. We look forward to seeing commitment grow to advance better policies, innovative thinking and supporting Indigenous leadership and the critical role Indigenous power proponents play in the remote community clean energy transition.

1. Introduction

Even as Canada shifts towards renewable energy, the majority of remote communities throughout the country continue to rely heavily (and in some case, exclusively) on fossil fuels to heat and power homes, businesses and community buildings. The past decade has brought about notable efforts to integrate renewable energy projects in these communities, but diesel-based generation continues to burden communities with interrelated social, environmental, and health impacts. Integrating renewable energy into these systems is complex and replete with technical, economical, and regulatory barriers.

The following research report focuses specifically on effective partnerships and project economics related to renewable energy deployment in northern Canada. It complements ongoing work by the Pembina Institute to reduce diesel dependency and greenhouse gas (GHG) emissions in remote communities. With support from the Mitacs Accelerate program, the research was conducted in parallel to Pembina's 2017 Renewables in Remote Communities Conference.¹ The conference convened representatives from Indigenous governments, Indigenous organizations, utilities, civil-society organizations, territorial and provincial governments, the federal government, and industry to discuss human and financial capacity in the context of remote renewable energy projects. The majority of the findings in this report are based on interviews conducted before, during, and after the conference.

This research also builds off prior research by the Pembina Institute detailed in the report *Power Purchase Policies for Remote Indigenous Communities*,² which was completed as part of the WWF Arctic Renewable Energy project to advance renewable deployment in the Arctic. The report examined provincial, territorial and leading international jurisdictions with renewable energy procurement policies. Focusing on the drivers behind procurement policies, we observed a need to better understand collaboration opportunities and challenges between power proponents and utilities. We were especially interested in learning more about partnerships and power purchase agreements (PPAs) in the territories so this research is based on interviews with

¹ Pembina Institute, "Renewables in Remote Communities: 2017 Conference."
<http://www.pembina.org/event/renewables-remote-communities>

² WWF Canada, "Power purchase policies for remote Indigenous communities in Canada"
<http://assets.wwf.ca/downloads/barrierstore.pdf>

individuals representing Indigenous power proponents, utilities, and territorial governments in Yukon, Northwest Territories, and Nunavut.

The report begins by providing a brief introduction to renewable energy developments in the three territories, including the political context for this research, and a short orientation to prior work on the topic. The report is then organized in two main sections: 1) Partnerships and 2) Project Economics and PPAs. Under Partnerships, we summarize participant views on project objectives, trust, open and transparent communication, engagement, ownership, the role of governments, and federal investment. In Project Economics and PPAs, we report on IPP policy developments, PPA negotiations, power purchase prices, and regulatory constraints. To conclude each section, we summarize the findings and list some successes and barriers expressed by participants. Lastly, we present some overall reflections on the research as well as some next steps for consideration.

1.1 Research goals

The main goal of this research is to better understand how Indigenous power proponents and utilities relate to each other as they advance the deployment of renewable energy projects in remote northern communities.

Specifically, the research aims to:

- Examine existing and proposed arrangements between Indigenous power proponents and utilities with the goal of illuminating how these parties might collaborate further.
- Examine how Indigenous power proponents and utilities are thinking about and navigating difficult project economics, with special attention to PPAs.

This work emphasizes the importance of constructive and mutually beneficial relationships between Indigenous power proponents and utilities while also considering the role of territorial governments.

1.2 Desired outcomes

With this research, we hope to make the following contributions:

- Support increased communication among participant groups and foster an appreciation for the challenges each group is experiencing

- Highlight conditions that enable Indigenous power proponents to develop renewable energy projects that fulfill their respective objectives
- Present key decision-makers and the utility sector with challenges and opportunities around pricing and contracting for renewable projects
- Offer a set of reflections that advance meaningful working relationships and the financial viability of remote renewable energy projects

We hope this work is valuable to all readers but especially interviewees and conference attendees. We are committed to sharing the report with those who participated in the research and continuing to create opportunities for dialogue around these topics and emerging issues.

1.3 Research scope

This research largely explores interactions between Indigenous power proponents and utilities in remote communities in three Canadian territories: Yukon, Northwest Territory (NWT) and Nunavut. Throughout this research, we use the term *territories* as well as the general term *the North* to refer to the territories, although the authors appreciate that the North is also used to reference the Inuit regions in Quebec (Nunatsiavut), and Labrador (Nunavik), and sometimes the northern regions of B.C., Alberta, Saskatchewan, Manitoba and Ontario. At times, we examine the role of the territorial government since most utilities operating in the territories are government-owned. We use the term *Indigenous power proponents* to mean Indigenous governments, economic development corporations (affiliated with Indigenous governments) or Indigenous businesses / entrepreneurs who wish to develop renewable power projects. In this report, we refer to *public utilities*, as in crown corporations that are owned and operated by the territorial government, and to *private utilities*. Both public and private utilities are regulated under the same territorial legislation.

There are multiple definitions of *remote communities* but in this context we mean communities with microgrids that rely on diesel as the primary source of electricity. In some jurisdictions, these are referred to as thermal zone communities. We have chosen this focus because of the special urgency and collective momentum to integrate renewables into these microgrids. There are no doubt important insights to be gained from researching partnerships between Indigenous power proponents and utilities in grid-connected areas but they are beyond the scope of this report. Relatedly, due to finite resources, this report only discusses projects in the Yukon, NWT, and Nunavut even though there are remote communities in Nunatsiavut and Nunavik as well as in

most provinces. We acknowledge that the territories have different regulatory, resource development, and operational landscapes but also believe there are fruitful comparisons to be made across the North.

Our research specifically examines how Indigenous power proponents and utilities are collaborating to displace diesel electricity generation with renewable energy. We recognize that this is only one facet of a much larger discussion about energy in the Arctic. We did not investigate the ways in which renewable energy projects might displace diesel for heating or transportation although these are crucial areas of study along with energy conservation and efficiency measures. Also, in focusing on distributed generation, we specifically asked research participants to comment on community and utility-scale projects rather than net metering programs. Net metering policies have been developed by a few jurisdictions and are typically smaller in size (under 10 kW) and connected behind the meter. This research is focused on larger projects that require direct integration with the utility's diesel infrastructure.

1.4 Research methods

This research is based on qualitative research methods, specifically conversations with those involved in electricity provisioning, policy development, and renewable energy project development. We began by reviewing publications about renewable energy in the Arctic and developing research questions about partnerships and project economics. We submitted a proposal to the Mitacs Accelerate program for research funding. We revised our proposal based on feedback from independent reviewers and then obtained ethics approval from the University of Victoria's human research ethics board.

We then invited representatives from Indigenous governments and organizations, territorial governments, utilities, and non-governmental organizations to participate in interviews. We interviewed participants before, during, and after the 2017 Renewables in Remote Communities conference and conducted follow-up interviews with approximately a third of participants. In total, we conducted 14 initial interviews and five follow-up interviews. We initially recruited participants from a large number of jurisdictions but eventually limited the scope to the Yukon, NWT, and Nunavut. The report is therefore based on information from 11 interviews and five follow-up interviews. We attempted to recruit an equal number of representatives from Indigenous power proponents, territorial governments, and utilities from each territory but we did not interview any Indigenous power proponents from Nunavut. We created

an audio recording of each interview, selectively transcribed participant responses, and analyzed the transcripts for emerging themes.

Additionally, we hosted an invitation-only discussion for Indigenous power proponents, utilities, governments, and key stakeholders following the Renewables in Remote Communities conference in Whitehorse. The report includes information heard from this session. Where necessary, we also draw from secondary sources such as policy documents, academic publications, and non-academic reports to fill in details and contextualize information from interviewees.

1.5 Acknowledgements

In discussing how various parties conceptualize Indigenous-utility partnerships, several points must be acknowledged in advance. There are many crucial relationships involved in implementing renewable energy projects in remote communities, all worthy of consideration. But rather than focusing on Indigenous partnerships with developers, other Indigenous power proponents, or various levels of governments, this research focuses on the relationship with utilities because these interactions have been under-examined and they are essential to the success of remote renewables. That said, territorial governments have taken on various roles with regards to the arrangements between Indigenous proponents and utilities, especially in their guidance to public utilities, so the research comments on their influence as well.

In sharing these findings, we wish to highlight all perspectives but have consciously prioritized the contributions of Indigenous interviewees to counterbalance the marginalization of Indigenous voices. This research is mindful of the impacts of colonization, the continuation of colonization, and the resulting power differential that exists between Indigenous peoples and other groups participating in this research. We hope to showcase Indigenous leadership in the deployment of renewable energy projects while emphasizing that all have role to play in creating successful partnerships.

The authors would also like to acknowledge that although this research has been conducted with the assistance of Indigenous power proponents in the North, it is nonetheless limited by our positions as non-Indigenous researchers in the south. We are aware that our positions necessarily affect the research process and may lead us to overlook important factors. We see this report as a discussion paper rather than the final word and welcome the opportunity to learn from feedback.

2. Background and context

2.1 Introduction

Approximately 265 remote communities in Canada are not connected to the North American electricity grid and rely on other forms of energy to produce electricity.^{3,4} Table 1 summarizes Canada's remote communities. 25 communities in Yukon and the NWT are connected to regional grids (which are predominantly hydro). Another 34 remote communities use micro-hydro electricity as a power source and 198 communities rely on fossil fuels (natural gas, diesel, heavy fuel oil). These 198 fossil fuel communities represent 75% of remote communities.

Remote communities is a community not connected to the North American electricity grid or the North American piped natural gas network. Remote communities in Canada include both Indigenous and non-Indigenous communities.

Table 1. Remote communities in Canada – primary power sources

| Primary power source | Non-Indigenous communities | Indigenous communities | Total number of communities |
|-------------------------------|----------------------------|------------------------|-----------------------------|
| Hydro | 25 | 9 | 34 |
| Territorial grid (Yukon, NWT) | 6 | 19 | 25 |
| Natural gas | 1 | 2 | 3 |
| Diesel | 48 | 140 | 188 |
| Heavy fuel oil | 7 | - | 7 |
| Unknown | 7 | 1 | 8 |
| TOTAL | 94 | 171 | 265 |

In these 198 communities, for the most part, electricity is generated by large diesel generators and distributed to community infrastructure, buildings and homes (this is often referred to as a microgrid). Relying on diesel means that large quantities of fuel must be transported every year to these remote communities. The use of diesel fuel

³ Aboriginal Affairs and Northern Development Canada and Natural Resources Canada, *Status of Remote/Off-Grid Communities in Canada* (2011).

https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/canmetenergy/files/pubs/2013-118_en.pdf

⁴ National Resources Canada, *Online Remote Community Energy Database*. <http://atlas.gc.ca/rced-bdece/en/index.html>

continues to burden remote communities and their populations with interrelated environmental, health and social impacts.

Specific to the territories, there are 54 remote communities that rely on diesel and two (Inuvik and Norman Wells) that rely on natural gas. These 53 remote diesel communities have an overall diesel capacity of 95.5 MW, as outlined in Table 2. Indigenous governments, utilities, territorial / provincial governments, federal governments and other stakeholders have been working together to decrease diesel reliance through renewable energy. Some renewable energy systems (most noticeably micro-hydro and geothermal) can be considered baseload technologies and have the potential to completely eliminate diesel fuel. However, other renewables like wind and solar are more intermittent, and typical diesel reductions currently average around 20%. With the technology advancement and introduction of variable speed generators, this diesel reduction can approach 50%. The level of diesel independence will depend on the key factors of renewable resources availability and technologies deployed. Most efforts in territorial remote communities will therefore be a complement of renewables integrated with existing diesel infrastructure with the potential of reducing diesel fuel up to 50% on an annual average.

To date, only one community-scale renewable energy project has been developed by Indigenous power proponents in a remote community in the territories, and a few more projects are in development. These projects are discussed in more detail in Section 2.4.

Table 2. Diesel capacity in territories

| Territory | Number of remote Indigenous communities | Diesel capacity (MW installed) |
|--------------|---|--------------------------------|
| Yukon | 4 | 8.5 |
| NWT | 25 | 33 |
| Nunavut | 25 | 54 |
| Total | 54 | 95.5 |

2.2 Physical context

It is not possible to discuss partnership opportunities and project economics without understanding some of the physical conditions that dictate the pace and scale of development in the territories. The North is a fascinating place and has a very unique

placement in Canada. The experiences and expertise of those in the North must be respected and solutions must be generated accordingly.

2.2.1 Renewable resources

Given that approximately 39% of the North is above the Arctic Circle, many regions experience extreme variation in daylight hours throughout the year, from full sunlight to full darkness.

The unique geography of the North presents both challenges and opportunities for renewable energy technologies. For example, a common misperception is that there is not enough sunlight in the North to justify investment in solar installations. This is a valid concern during the winter but with continued commercialization and availability of battery storage technologies, solar PV also presents an excellent solution for large reductions in diesel fuel during the summer and shoulder seasons of spring and fall.

Wind turbine projects must consider blade ice loading, wind shear and other installation challenges but these can be overcome, as shown in Alaska's success in wind turbine deployment.⁵ As well, many northern communities are located near large bodies of water where wind speeds are typically greater; colder, denser northern air is also favourable for wind generation.

Finally, biomass energy systems present a challenge in some parts of the North simply because biomass resources may be limited or non-existent (e.g. in Nunavut). Yet in other areas, bioenergy heating solutions have been pursued with positive outcomes, such as the Fort McPherson biomass district heating project.⁶

2.2.2 Geography and remoteness

Many communities in the North are situated a great distance from each other. For example, Nunavut's 25 communities are spread across almost 2 million square kilometres. Remoteness greatly affects the technical, logistical, and financial feasibility of renewable energy systems:

- Securing technical expertise, both for establishing and maintaining renewable energy systems, can be a challenge in remote communities.

⁵ Ian Baring-Gould, *Wind Energy Deployment In Isolated Islanded Power Systems: Challenges & Realities* (National Renewable Energy Laboratory, 2014). <https://www.nrel.gov/docs/fy14osti/61253.pdf>

⁶ Bullfrog Power, *Fort McPherson Biomass District Heating Project*. https://www.bullfrogpower.com/wp-content/uploads/2015/09/Fort_McPherson-Biomass.pdf

- Logistically speaking, transporting equipment and supplies over large distances and different terrain can be difficult and expensive. Infrastructure and equipment taken for granted in the south is often limited in the north or just not available. Transportation options can also be limiting factors especially when communities are connected by winter roads that are only available for short periods through the year.
- Delays and lack of equipment and expertise can quickly drive costs up significantly. With this, project risk increases and becomes a major consideration in project execution and financing.

2.2.3 Climate

The Arctic is particularly sensitive to climate change. Global climate model simulations predict that even when limiting the average global temperature increase to 2°C, the Arctic will experience an increase of 3.2°C to 6.6°C.⁷ This is due to the amplification effects of the positive feedback loop called the ice albedo effect: white snow and ice reflect much of the sun's energy, but rising temperatures melt this snow and ice cover, revealing darker land masses that absorb more solar energy, causing further temperature increases and more snow melt.

Permafrost (ground that is permanently frozen throughout the year) also presents a challenge in the North. Melting permafrost affects the development of renewable energy infrastructure; wind turbine and solar PV foundations require special design considerations.

2.3 Political context

Along with the North's distinctive resources, geography, and climate, come equally unique social and political systems that must be also be considered in deploying renewable energy projects.

2.3.1 Governance

Over the last several decades, the territories have taken over certain jurisdictional responsibilities formerly assigned to the federal government. Devolution is the transfer

⁷ WWF International Arctic Programme (2005), *2° is too much: Evidence and Implications of Dangerous Climate Change in the Arctic*

of province-like responsibilities from the Federal Government to the territories. Yukon went through a devolution process in 2003;⁸ NWT signed a devolution agreement with the federal government which came into effect on April 1, 2014;⁹ and Nunavut was established as part of a comprehensive land claim agreement and officially separated from NWT in 1999.

In concert with devolution, Indigenous governments have been negotiating treaty and land claim agreements as well as self-government agreements. As of 2016, there were 22 self-government agreements across Canada with many of these being in the territories; in Yukon, 11 of 14 First Nations are self-governing¹⁰ and there are two self-government agreements in NWT.¹¹ Nunavut was created as the homeland for the Nunavut Inuit. The Nunavut Land Claims Agreement, protected as a “Treaty” by Section 35 of the Canadian Constitution, creates a legal framework including several of Institutions of Public Government which the Inuit have a direct role in governing. As the only Canadian territory or province created by a modern land claim agreement, Nunavut is unique in the manner in which it is governed.

More than 100 treaty and land claim agreements are currently in negotiation across Canada; 90 of these involve self-government negotiations.¹² This speaks to the trend towards involving Indigenous people in the governance of their own communities and ultimately their own well-being. Even with such progress, there is a great deal yet to be done before Canada’s Indigenous communities are all self-governing in a manner that meets their vision and collective aspirations.

2.3.2 Federal commitments

Over the past two years, the federal government has announced their further commitment to support improving the lives and well-being of Indigenous peoples in

⁸ Indigenous and Northern Affairs Canada, “Yukon Devolution,” 2013. <https://www.aadnc-aandc.gc.ca/eng/1352470994098/1352471080537>

⁹ *Northwest Territories Lands and Resources Devolution Agreement* (2013). <http://devolution.gov.nt.ca/wp-content/uploads/2013/09/Final-Devolution-Agreement.pdf>

¹⁰ Indigenous and Northern Affairs Canada, “Building The Future: Yukon First Nation Self-Government,” 2011. <http://www.aadnc-aandc.gc.ca/eng/1316214942825/1316215019710>

¹¹ Northwest Territories Executive and Indigenous Affairs, “Concluding and Implementing Land Claim and Self-Government Agreements.” <https://www.eia.gov.nt.ca/en/priorities/concluding-and-implementing-land-claim-and-self-government-agreements/existing-agreements>

¹² Indigenous and Northern Affairs Canada, “Fact Sheet: Aboriginal Self-Government,” 2015. <https://www.aadnc-aandc.gc.ca/eng/1100100016293/1100100016294>

Canada, with an increase in funding for culture, language, health, education, housing, environment and climate change mitigation / adaptation. Budget 2016 (delivered March 2016) saw an increase of \$8.4 billion over five years to improve the social and economic conditions of Indigenous Peoples and their communities.¹³ Budget 2017 (delivered March 2017) saw a further increase to support Indigenous People in Canada.¹⁴ Specifically, it included direct investments towards diesel reduction in communities and some investments provide ancillary support for reducing diesel consumption and mitigating the impacts of climate change through clean growth innovation, green infrastructure and low carbon technologies. The direct investments presented in Budget 2017 have intentional focus towards Indigenous community engagement, energy literacy, energy planning, energy efficiency and the technology deployment of renewable energy (both heat and power) systems.

Within Budget 2017 was a commitment to \$650 million over four years to support the Pan-Canadian Framework (PCF) on Clean Growth and Climate Change.¹⁵ This funding framework includes a number of investments focused on diesel reduction in remote communities. These commitments are based on the PCF pillars of climate change and economic growth and also reconciliation and a renewed relationship with Indigenous peoples.

The main Budget 2017 funding programs focused on diesel-based remote communities include:

- **Natural Resources Canada:** \$220 million over six years to reduce the reliance of rural and remote communities on diesel fuel, and support the use of more sustainable, renewable power solutions.
- **Natural Resources Canada:** \$75 million over four years for new innovative Challenge-based approaches for clean technologies. A portion of this will go towards the Off-Diesel Challenge.
- **Indigenous and Northern Affairs Canada:** \$53.5 million over ten years and \$5.4 million ongoing to continue the Northern Responsible Energy Approach for Community Heat and Electricity Program (Northern REACHE).

¹³ Government of Canada, *Growing the Middle Class* (2016).
<https://www.budget.gc.ca/2016/docs/plan/budget2016-en.pdf>

¹⁴ Government of Canada, *Building a Strong Middle Class* (2017).
<https://www.budget.gc.ca/2017/docs/plan/budget-2017-en.pdf>

¹⁵ Government of Canada, *Pan-Canadian Framework on Clean Growth and Climate Change* (2017).
<https://www.canada.ca/content/dam/themes/environment/documents/weather1/20170125-en.pdf>

- **Infrastructure Canada:** \$400 million over ten years in an Arctic Energy Fund to address energy security for communities north of the 60th parallel, including Indigenous communities. Funding will be delivered through integrated bilateral agreements with territorial governments.

There has also been a recent emphasis on renewing Canada’s relationship with Indigenous People of Canada. One of the recent statements from the federal government on advancing reconciliation with Indigenous Peoples announced a commitment to improve relations based on the “recognition of rights, respect, co-operation and partnership as the foundation for transformative change.”¹⁶

Intrinsic to this meaningful effort is the continued work to revisit Canada’s approach to the inherent rights of Indigenous Peoples and the ongoing negotiations of self-governance and independence.¹⁷ Canada’s official sign-on to the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in 2016¹⁸ (although it still needs to be implemented) and the establishment of the Truth and Reconciliation Commission of Canada¹⁹ give promise to the long process of improving relations and partnerships with Indigenous Peoples. Ten principles have been created that will govern the evolution of this new relationship,²⁰ and speak to Indigenous self-determination, self-governance, respect, meaningful engagement, renewed fiscal relationships and economic partnerships.

This research and the goals laid out herein have a clear and obvious connection to renewing relationships with Indigenous Peoples. Advancing meaningful relationships and business partnerships by governments, utilities and the corporate sector, whether through directly convening conversations and building awareness or through the creation of sound governance and financial policies and programs, will help support

¹⁶ Prime Minister of Canada, “Statement by the Prime Minister of Canada on advancing reconciliation with Indigenous Peoples,” December 15, 2016. <https://pm.gc.ca/eng/news/2016/12/15/statement-prime-minister-canada-advancing-reconciliation-indigenous-peoples>

¹⁷ Indigenous and Northern Affairs Canada, “The Government of Canada’s Approach to Implementation of the Inherent Right and the Negotiation of Aboriginal Self-Government,” 2009. <https://www.aadnc-aandc.gc.ca/eng/1100100031843/1100100031844>

¹⁸ Indigenous and Northern Affairs Canada, “United Nations Declaration on the Rights of Indigenous Peoples,” 2009. <https://www.aadnc-aandc.gc.ca/eng/1309374407406/1309374458958>

¹⁹ Truth and Reconciliation Commission of Canada, “FAQs.” <http://www.trc.ca/websites/trcinstitution/index.php?p=10>

²⁰ Canada Department of Justice, “Principles respecting the Government of Canada’s relationship with Indigenous peoples,” 2018. <http://www.justice.gc.ca/eng/csj-sjc/principles-principes.html>

economic development and give Indigenous communities the opportunity to directly guide their future energy infrastructure and projects.

2.4 Regional context

The following sections refer to the remote communities shown in Figure 1. Red communities signify diesel-dependent communities.

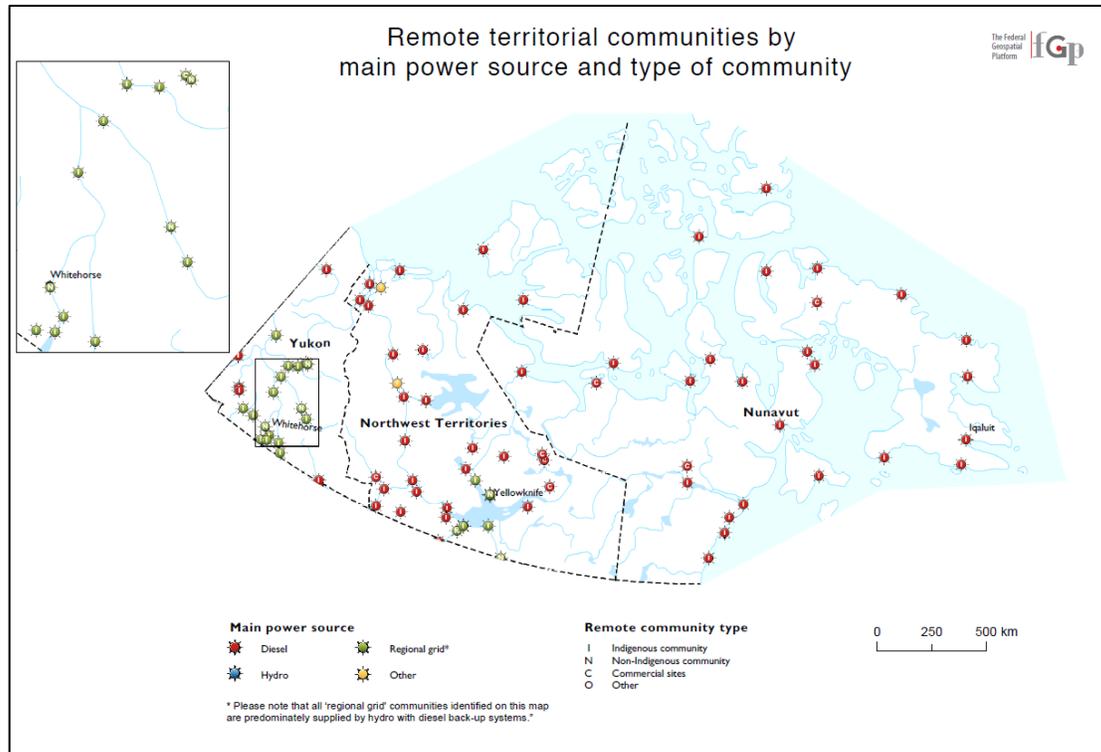


Figure 1. Remote communities in Canadian territories

Modified from Natural Resources Canada²¹

2.4.1 Yukon

Yukon derives the majority of its electricity from hydro and is served primarily by the public utility, Yukon Energy Corporation. However, four communities lie outside of the hydro zone and rely exclusively on diesel generation systems owned and operated by ATCO Electric Yukon, the private utility: Old Crow, Burwash Landing/Destruction Bay,

²¹ Natural Resources Canada, *Annex A map*. Data from Remote Communities Database (.xls). 2017.

Beaver Creek, and Watson Lake (see Figure 1).²² Collectively, these thermal zone communities have 8.5 MW of diesel capacity.²³

Electricity rates throughout Yukon are regulated and approved by the Yukon Public Utilities Board. Residential non-government rates are fully harmonized in all communities with the exception of Old Crow where rates are about twice as high as those of other communities (for every kWh consumed over 2,500 kWh per month).

The cost of generating electricity in thermal zone communities varies but is much higher than the hydro zone. However, the costs of electricity generation in the thermal zone are distributed among all ratepayers. As a result, the electricity rate is the same in both zones. This rate equalization is mandated to the Yukon Utility Board as legislated through the Public Utilities Act.²⁴

Two remote Indigenous communities are in the process of developing community-scale renewable energy projects. Kluane First Nation Government, located in Burwash Landing, is developing a 300 kW wind project. In Old Crow, the Vuntut Gwich'in Government is working on a 400 kW solar project with 400 kWh of battery storage. Both governments have signed MOUs with their utility and are currently in the process of negotiating PPAs. The Yukon government is supportive of these arrangements and is learning from the discussions as it revises an IPP policy that was released in 2015. Apart from these pending projects, there are no other community or utility-scale renewable energy projects in remote communities in Yukon.

2.4.2 NWT

Of the NWT's 33 communities, 25 depend on diesel for electricity generation as seen in Figure 1. The thermal zone is primarily served by the public utility, the Northwest Territories Power Corporation (NTPC), but four communities (Sambaa K'e, also known as Trout Lake, Fort Providence, Wekweekti, and Kakisa) are served by the private utility, Northlands Utilities, which is owned by ATCO Electric and Denendeh Investments

²² Watson Lake has a medium-sized diesel-based grid and is the only thermal zone community eligible for the standing offer program. The three smaller, isolated communities (Old Crow, Beaver Creek and Destruction Bay/Burwash Landing) fall under the Unsolicited Proposals Process, discussed in greater detail in Section 4.

²³ K. Karaanasios and P. Parker, "Recent Developments in Renewable Energy in Remote Aboriginal Communities, Yukon, Canada," *Papers in Canadian Economic Development*, 16 (2016). <http://pced.uwaterloo.ca/index.php/pced/issue/view/13>

²⁴ Government of Yukon, *Public Utilities Act*. http://yukonutilitiesboard.yk.ca/pdf/General/149_pua.pdf

Incorporated. Collectively, these 25 diesel-dependent communities have approximately 33 MW of diesel capacity.²⁵

Similar to Yukon, the cost of generating electricity in thermal zone communities varies but the cost is much higher than the hydro zone. However, the costs of electricity generation in the thermal zone are distributed among all ratepayers based on new rate policy guidelines that have seven different territorial rate zones.

There have been a handful of community-scale renewable energy developments, including Colville Lake and Fort Simpson, but only one initiated by an Indigenous power proponent. In 2015, Lutsel K'e Dene First Nations signed a PPA with NTPC and developed a 35 kW solar PV system that is connected to NTPC's diesel microgrid.

Other renewable energy projects are being considered including the Inuvik Wind Project, which the Government of the NWT (GNWT) mentions among other alternative energy solutions in its Draft 2030 Energy Strategy.²⁶ The strategy contains several objectives that pertain to diesel-dependent Indigenous communities and will be finalized by spring 2018.

2.4.3 Nunavut

Nunavut is unique in that all of its 25 remote communities are dependent on diesel for electricity generation, as seen in Figure 1. The public utility, Qulliq Energy Corporation (QEC), delivers electricity to these communities through 25 standalone diesel power plants with an approximate capacity of nearly 54 MW.²⁷

Regulator - Minister responsible for Qulliq Energy Corporation and the Executive Council (www.gov.nu.ca/cabinet)

There are currently no community or utility-scale renewable energy projects under development, but progress is being made on various fronts. Until recently, Nunavut legislation prohibited the utility from purchasing electricity from other entities (i.e. IPPs). The legislation is now in the process of being changed and QEC is developing an IPP policy that they hope to finalize by 2019. This IPP policy will open up the door to

²⁵ “Recent Developments in Renewable Energy in Remote Aboriginal Communities, Yukon, Canada.”

²⁶ Government of Northwest Territories, *2030 Energy Strategy* (2017).

https://www.inf.gov.nt.ca/sites/inf/files/resources/gnwt_inf_7047_energy_strategy_p7_0.pdf

²⁷ “Recent Developments in Renewable Energy in Remote Aboriginal Communities, Yukon, Canada.”

other entities producing and selling power to QEC. In the meantime, QEC has launched its net metering program and is now accepting applications.

2.5 Prior research

There is a growing body of research on renewable energy projects in remote communities from both scholarly and non-scholarly sources. To date, research has emphasized the technical and financial dimensions of electricity generation as well as some aspects of governance. Most documents contain recommendations for action at international, national, regional, and/or local levels, but the intended audience varies greatly. Some reports and toolkits are written for policy-makers²⁸ and practitioners,²⁹ while others address the research requests of specific organizations. The topic of renewable energy projects in the Arctic and Subarctic has been the target of notable international collaboration.³⁰ Within Canada, the research tends to focus on the three territories,³¹ especially Nunavut,^{32,33,34} but there are a handful of documents that examine renewables in remote communities in other regions of the country.^{35, 36, 37, 38}

²⁸ J. Knowles, *Power Shift: Electricity for Canada's Remote Communities* (Conference Board of Canada, 2016). http://www.conferenceboard.ca/temp/cd1c71e4-1251-48f9-93a3-aa7025fd90eb/8249_powershift_rpt.pdf

²⁹ J. Sayers, *B.C. First Nations Clean Energy Toolkit* (2015).

³⁰ G. Poelzer et al., *Developing Renewable Energy in Arctic and Sub-Arctic Regions and Communities: Working recommendations of the Fulbright Arctic Initiative Energy Group* (2016). <https://renewableenergy.usask.ca/documents/FulbrightArcRenewableEnergy.pdf>

³¹ D. Cherniak et al., *Report on the State of Alternative Energy in the Arctic* (2015).

Standing Senate Committee on Energy, the Environment, and Natural Resources, *Powering Canada's Territories* (2015).

³² Navigant Consulting, *Reducing Barriers to Financing and Accelerating the Deployment of Renewables in the Arctic* (2017). http://assets.wwf.ca/downloads/Financing_Renewable_Energy.pdf

³³ WWF Canada, *Costing Energy and Fossil Fuel Subsidies in Nunavut: A mapping exercise*, prepared by International Institute for Sustainable Development (2017). http://assets.wwf.ca/downloads/costing_fossil_fuel_subsidies_in_nunavut.pdf

³⁴ WWF Canada, *Fuelling Change in the Arctic - Phase II Renewable Energy Solutions for the Canadian Arctic*, prepared by I. Das, and C. Canizares (2016). http://assets.wwf.ca/downloads/full_report__feasibility.pdf

³⁵ K. Karanasios and P. Parker, "Tracking the transition to renewable electricity in remote indigenous communities in Canada." *Energy Policy*, 118 (2018). <https://doi.org/10.1016/j.enpol.2018.03.032>

³⁶ M. M. Kennedy, *Energy shift: Reducing diesel reliance in remote communities in B.C.* Graduate project, Simon Fraser University, 2015. <http://summit.sfu.ca/item/17979>

³⁷ L. Keyte, *Energy Resilience in Northern Communities: Critical Success Factors for Sustainable Energy*. Thesis, Trent University. http://www.academia.edu/download/40152510/Thesis_LK_final.pdf

A review of available research reveals limited information on partnerships. The subject of partnership is typically mentioned only in passing, situated in the abstract, and not especially tailored to remote communities. Some work aimed at Indigenous power proponents focuses on establishing partnerships but it largely refers to corporate partners rather than utilities, other Indigenous communities, or government.³⁹ This report aims to partially address this gap by focusing on relationships between Indigenous power proponents and utilities.

There is considerably more information on project economics to draw upon in contextualizing interview findings. The research presented in this report builds on previous work about governance, financing mechanisms, subsidies, and the cost of diesel. Two key reports in the past year have focused on subsidies and the true cost of diesel-generated electricity.

Regarding subsidies applied to diesel fuel and electricity, research commissioned by WWF Canada⁴⁰ looked at subsidy rates and structures in Nunavut and concluded that electricity rates in Nunavut are highly subsidized by territorial and federal governments. Approximately 63% of electricity rates to Nunavut residential customers are subsidized – residential electricity rates are set at \$0.30 per kWh where subsidies (through a variety of mechanisms) range from \$0.30 to \$0.84 per kWh. This high level of subsidization translates to the Government of Nunavut spending on average \$60.5 million each year to subsidize diesel fuel and is indication that electricity generated from diesel fuel is not an affordable energy source and requires government support to keep energy costs relatively affordable.

Regarding the true cost of diesel power, a research report entitled *Diverging from Diesel*⁴¹ used public available cost data (from utility General Rate Applications) on fossil fuel thermal power generation in specific northern remote communities in the territories. The research revealed that the quantified avoided cost of diesel was higher than stated. The research points towards a very important consideration when power purchase rates are being discussed and the fact there are potential for cost reductions by transitioning

³⁸ M. Arriaga, C.A. Cañizares and M. Kazerani, Renewable Energy Alternatives for Remote Communities in Northern Ontario, Canada. *IEEE Transactions on Sustainable Energy*, 4(3), (2013).

<https://doi.org/10.1109/TSTE.2012.2234154>

³⁹ Chris Henderson, *Aboriginal power: clean energy & the future of Canada's First Peoples* (Erin, Ont: Rainforest Editions, 2013).

⁴⁰ *Costing Energy Fossil Fuel Subsidies in Nunavut: A Mapping Exercise*.

⁴¹ InterGroup Consultants of Winnipeg, *Diverging from Diesel*, prepared for Gwich'in Council International (2017). <https://gwichincouncil.com/diverging-diesel>

from diesel fuel to renewables and these savings could be considered when negotiating power prices.

3. Key findings – Partnerships

3.1 Key partnerships considerations

As stated in the introduction, one of the primary goals of this research is to better understand how Indigenous power proponents and utilities are collaborating to advance renewable energy projects. Because of the complexities of northern development, strong working relationships are fundamental to successful projects, yet few researchers have explored the topic in any depth. The section outlines some of the ways in which participants are thinking about existing and prospective working relationships. There are many ways in which Indigenous power proponents and utilities might work together ranging from informal collaboration to the formation of new entities including joint ventures, partnerships, and limited partnerships.

In what follows, we use the word “partnership” in a general sense rather than a corporate one. It is employed as an umbrella term to cover any collaboration between utilities and Indigenous power proponents.

We asked interviewees and conference attendees to describe the qualities of good partnerships as well as their priorities when entering into partnerships. Reflecting on their experiences and aspirations, participants identified a range of approaches to partnership development. We present key considerations below and recommend that these findings be read as ongoing discussions that vary by region and participant group.

3.1.1 Project objectives

One of the first discussions to be had in establishing effective working relationships between utilities and Indigenous power proponents is about project objectives. What is motivating each party to pursue renewable energy options? What does each party want to accomplish? How can parties work together on their respective goals? When the answers to these questions are openly explored at the outset of project development, those participating in the discussions gain an understanding of their own and each other’s priorities. Participants emphasized that this understanding is crucial for parties to work well together. When project motivations are presumed, unknown, or disregarded, conflict is likely to follow.

Over the course of doing this research, participants identified many reasons to integrate renewable energy into diesel-based grids. One Indigenous power proponent shared that

their project arose partly from the desire to address the impact of climate change. Many of their members still live a subsistence lifestyle and have noticed changes in the environment. By reducing their diesel consumption through renewable generation, they anticipate a number of benefits: lower GHG emissions, improved air quality, reduced noise pollution, increased reliability from their electrical system, and lower risks associated with transporting diesel fuel. Another Indigenous power proponent noted that they not only aim to eliminate diesel completely but also look forward to assuming a leadership role in the renewable energy industry and becoming a major player in the region. Yet another proponent discussed their desire to make renewable energy commonplace and accessible to their community but to do so responsibly, installing only as much generating capacity as necessary.

As for utilities, many participants referred to the mandate of utilities to deliver safe, affordable, reliable power. However, there is now considerable external pressure for utilities to broaden their mandate to include the provision of renewable energy. Indigenous power proponents, and territorial and federal governments are also calling upon utilities to move towards decentralized generation. In addition to meeting these demands, some participants commented that utilities are also poised to benefit from renewable energy partnerships in at least two other ways:

1. Purchasing renewable energy from Indigenous power proponents offers utilities the opportunity to adopt new business models and to strengthen and repair relationships with Indigenous governments.
2. Developing renewable energy projects with Indigenous power proponents may permit utilities to cover significant modernization costs. By submitting joint applications to access federal funding, utilities are in a better position to balance diesel infrastructure upgrades with investment in renewable generation.

Given all the possible reasons why utilities and Indigenous power proponents might want to develop renewable energy projects, participants emphasized that it is important for all parties to communicate their intentions to each other. Some participants commented that it is not always possible to meet all objectives through a single project and parties must therefore identify and agree upon the priorities of the project. These decisions ultimately affect the nature and the scope of the project. For example, some participants noted possible tensions in pursuing both GHG emissions reductions and reconciliation between utilities and Indigenous communities. These goals are not necessarily incompatible but must be openly deliberated rather than presumed. Relatedly, what may seem technically expedient or cost efficient does not necessarily translate into the best capacity-building or ownership opportunities for communities.

Participants expressed the desire to find mutuality in project objectives but also highlighted the influence of government directives that dictate funding availability and criteria.

3.1.2 Trust

Many participants commented on trust as an essential component of successful partnerships but noted that it is greatly lacking, especially towards utilities. The reasons for this mistrust are numerous and deeply rooted. In general, Indigenous communities are uncertain about whom to trust due to a legacy of over-solicitation and lack of results from industry and consultants. Indigenous communities have experienced this pattern of extraction and abandonment from the renewable energy industry as well. Participants also described a general aversion towards utilities in the North. Several participants, including utility representatives, spoke about these negative perceptions of utilities, which are partly due to the high cost of electricity among remote communities. Representatives from utilities are aware of this reputational challenge and acknowledge the need to actively build trust among their customers.

With regards to establishing renewable energy partnerships, some Indigenous participants highlighted the power imbalances that make it challenging to trust utilities. The size, organizational power, and energy expertise of utilities typically dwarfs that of Indigenous power proponents. While not all interactions with utilities are necessarily adversarial, Indigenous participants made it clear that they did not feel they were on equal footing. This challenging dynamic is compounded by the fact that public utilities are governed by territorial governments and therefore inextricably bound to the troubles of past and present-day colonialism. Participants also spoke of a particular wariness towards private utilities, noting concerns about their motives and accountability structures. In particular, some participants questioned whether utilities could be trusted with renewable energy developments if they were also involved in the oil and gas industry.

The consequences of mistrust are far reaching and significantly hinder the deployment of renewable energy projects, especially during the early stages of development. Several Indigenous power proponents described missed opportunities, or work that could have been shared or done more effectively had there been a trusting relationship with the utility at the outset.

As such, many participants had opinions on how to increase trust. For example, it was suggested that Indigenous power proponents review a utility's track record to see whether they had a history of productive working relationships with Indigenous

communities, organizations, and/or governments. Conversely, some participants argued that trust is built in real time through repeated actions, meaning that a good reputation in one community is not sufficient for establishing trustworthiness in another.

It was also suggested that parties might find it easier to trust each other if they had equal access to information and a better understanding of each other's processes. Several participants used the expression “you don't know what you don't know” to describe the frustration that occurs when proponents are presumed to understand the utilities' procedures but in fact have never been made aware. Participants therefore highlighted the importance of sharing needs, limitations and challenges through open and transparent communication.

3.1.3 Open and transparent communication

Almost all participants, irrespective of region or interviewee group, expressed a desire for more open, honest communication between everyone involved. Participants mentioned the high potential for miscommunication and conflict and thus the need to get together more frequently for both formal and informal discussions. Indigenous power proponents also noted that they would like to see utilities enter conversations willingly and even proactively, without waiting to be called to the table.

In addition to expressing preferences around communication processes, participants also discussed the kind of information they wish to exchange or receive from each other. Several participants noted that Indigenous power proponents require data about their community's energy use (i.e. monthly / yearly consumption and peak demand) and they should be able to obtain it from the utility without hassle. When renewable integration is being considered, it was also suggested that grid interconnection requirements be clearly demonstrated so that Indigenous power proponents know exactly what to expect.

On the utility side, representatives would like to hear more about proposed project designs, particularly when third parties are involved, so as to get on the same page earlier. Utilities also anticipate needing to exchange information with Indigenous power proponents in order to secure funding from the federal government.

Communication appears to break down in particular when it comes to calculating the costs of renewable versus diesel-based electricity generation. Utility representatives expressed their willingness to share openly about their business expenses but several Indigenous power proponents remain frustrated by the lack of clear information. While information about the cost of diesel can be found in rate filing documentation, it is not

presented in an easily accessible manner. Several participants suggested that utilities take a leading role in providing education about regulatory regimes and diesel costs in a way that accounts for capacity challenges in small northern communities. More than just consistent, clear communication, however, participants are calling upon each other to consider all aspects of engagement, as discussed below.

3.1.4 Engagement

The term engagement was heavily emphasized among participants, with many describing it as a compulsory component of renewable energy project development. Participants spoke of engagement as both the precursor to partnership and the substance of partnership itself. As a precursor to partnerships, both Indigenous power proponents and utilities agreed that partnerships could not exist without someone taking the initiative to open the line of communication. Both parties expressed that they would like to hear from each other sooner and encouraged each other to make the first move. Indigenous participants noted that they would like to hear from utilities even if the communities are experiencing capacity deficits or consultation fatigue.

When discussing engagement as the substance of partnership itself, participants suggested that it should continue and intensify once a relationship has been established. One participant noted that engagement ought to include the wider community, not just those responsible for managing project development. This type of engagement could involve general educational events to improve energy literacy and/or training on specific aspects of project development. Another participant stressed the need for holistic engagement, arguing that all aspects of energy use must be considered together in the context of how people actually live in the North.

Overall, participants view engagement as the utility's responsibility, one that utilities have only recently begun to acknowledge and take seriously. In addition to pressure from various levels of government, utilities everywhere are grappling with the demands of distributed renewable energy generation. As they move from providing and distributing electricity to buying it from multiple sources, utility representatives admit that engagement is a new norm and they have a considerable amount to learn.

Participants generally suggested that utilities increase and diversify their engagement tactics. They also suggested that utilities improve their knowledge of Indigenous rights and title, organizational realities, and ways of life. One participant noted the importance of utilities asking for guidance about protocol, underlining that a thoughtful and tailored approach is needed for each community.

Some utilities have dedicated significant resources to engagement, while others are only just beginning to reach out to Indigenous communities. One Indigenous participant suggested that Indigenous power proponents might also articulate to utilities in more explicit terms the value they see themselves adding to partnerships. Given that utilities have not been in the habit of engaging Indigenous governments, it was suggested that they might not fully recognize the opportunities that might exist, including access to various kinds of financing. According to this participant, engagement should lead to a close relationship, where parties jointly seek out project opportunities that enable Indigenous power proponents to participate as partial or full owners.

3.1.5 Ownership

Project ownership featured prominently among interviewee comments but opinions varied within groups. For Indigenous power proponents, the discussion about ownership was really one of energy autonomy and how to best achieve independence through renewable energy projects. Some Indigenous power proponents expressed that it was important to have 100% ownership in the project. However, full ownership has different meanings to different parties. For example, to Lustsel K'e Dene First Nations, full ownership meant community ownership of their solar project. They opted to sell electricity to NTPC as an IPP rather than participate in the net metering program so they could own the medium-sized renewable system as a collective. In other cases, full ownership means ownership over the entire renewable system, not just the means to generation. Some Indigenous power proponents have been considering what it would mean to own the technology both to generate electricity and to store it. An ownership arrangement of this kind could, for example, involve owning solar PV panels but also the micro-controller and either batteries or thermal electrical storage.

In remote communities, storage is crucial to achieving a high level of renewable energy penetration. Some participants have commented that owning storage technology in addition to the generation technology would allow Indigenous power proponents more autonomy over the renewable energy system. However, storage can be technologically complex and expensive, and may require more maintenance, so not all Indigenous power producers are interested. The balance of ownership also depends on the utility's preference. In Yukon, ATCO is proposing that IPPs own the renewable electricity generation component while the utility own the storage. Their rationale for this approach is based both on grid stability and liability. Likewise, the GNWT deems storage and interconnection controls to be core utility assets and prohibits their ownership by IPPs (for community-scale projects) unless otherwise agreed to by the utility. In

Nunavut, however, QEC foresees an arrangement where IPPs would own both generation and storage but no decisions on the matter have been reached yet.

We also heard from Indigenous power proponents that full and/or majority equity ownership may work well for certain renewable energy projects but may not be possible or desirable for all projects. One Indigenous power proponent said that ownership was secondary to their goal of displacing diesel. Their vision of energy autonomy depends on a 100% reduction in diesel fuel; owning the means of generation is optimal but not essential. Additionally, full ownership may be too risky or financially difficult for certain Indigenous power proponents so developing a successful project might involve sharing equity with utilities or third parties.

Policies on third-party involvement vary by territory. The Government of Yukon’s IPP policy opens the door to third parties but states that at least 50% of new IPP projects must involve First Nation ownership. However, the policy does not specify the balance of equity per project. In NWT, the Draft 2030 Energy Strategy stipulates that new community-owned renewable power projects must be majority owned by a community or Aboriginal government or community based organization.⁴² Additionally, the GNWT prefers that the utility be directly involved in projects that aim to generate more than approximately 20% of a community’s average load. In other words, the Energy Strategy leaves room for third-party involvement but only a minority ownership role in the case of small projects and a mandatory partnership with the utility in the case of large projects. In Nunavut, QEC has so far taken a neutral stance towards third parties but has suggested that it may be harder for Indigenous power proponents to earn a return on their investment considering that third-party developers require relatively rapid financial returns.

3.1.6 Role of governments

Participants described notable variation in partnership formation across the territories, revealing different roles for territorial government in each jurisdiction.

The Government of Yukon is considerably involved in discussions between Indigenous power proponents and utilities; they have taken a hands-on approach to the development of renewables in remote communities, providing support where needed.

⁴² According to the GNWT, community scale projects are between 15 kW and the community-based limit of renewable power, which is usually around 20% of a community’s load.

Equipped with an understanding of the benefits and challenges to each party, the government has made it a priority to act as a facilitator when requested.

In NWT, the government outlines its intended involvement in the Draft 2030 Energy Strategy. Objective 1, “Work Together to Find Solutions: Engagement, Participation, and Empowerment,” puts forward eight actions and promises to work within the GNWT existing approach to engaging with Aboriginal governments. The Energy Strategy also highlights the central role of the Arctic Energy Alliance. This non-profit organization is funded by the GNWT and aims to help communities, consumers, producers, regulators and policymakers to work together to reduce the costs and environmental impacts of energy and utility services in the NWT.⁴⁵ Their knowledge of local energy issues and their connection to specific communities has been instrumental in getting Indigenous governments and NTPC on the same page with regards to project goals.

By contrast, the Government of Nunavut recently went through an internal reorganization and is still planning how to best implement programs and policies to support renewable energy projects. The government has stated its support for renewable energy projects but is not currently involved in project development. However, the utility, QEC, has stated its intention to pursue partnerships with Indigenous power proponents and is already engaging in discussion with certain communities. QEC’s approach is to consult early, often, and face-to-face as much as possible. Rather than work through the government, they have taken on the task of building partnerships themselves.

3.1.7 Federal investment

As mentioned in Section 2, the federal government announced additional funding programs focused on diesel fuel reduction in remote communities in Budget 2017. Not surprisingly, the commitments are beginning to influence partnership development in the North. Participants in the Yukon reported that the availability of new federal funding is driving utilities and Indigenous power proponents to collaborate in a more concerted manner. The Government of Yukon has encouraged Indigenous power proponents and the private utility to work together on proposals to the federal government, arguing that early collaboration makes for stronger applications. Those involved say that the prospect of joint funding has prompted them to examine partnership opportunities that would not otherwise have surfaced as quickly.

⁴⁵ Arctic Energy Alliance. <http://aea.nt.ca>

For some utilities, there is hope that federal funding will improve the business case for renewable generation when the cost of implementing renewables exceeds the cost of diesel-based systems. For Indigenous power proponents, there are concerns and questions about the delivery of federal funding. Some urgently require funding to move forward with their projects but have not yet been able to access it. There are a substantial number of new programs administered by several different federal ministries and participants stated that they would like to know when funding will be available, whether program funding can be combined, and how decisions will be made.

3.2 Summary

In discussing partnership development, participants raised a number of considerations that were then grouped into seven themes. These themes reflect current areas of focus and concern for Indigenous power proponents, utility representatives, and territorial governments. While many of these themes, such as trust or engagement, may seem obvious or simple, the comments demonstrate that nothing should be taken for granted in these new collaborations. All parties are figuring out how to relate to each other in the context of integrating renewable energy projects and in many cases, this means transforming how they formerly interacted. Key points are summarized below.

3.2.1 Project objectives

Participants expressed different motivations for pursuing renewables and emphasized that transparency around project objectives is crucial for parties to navigate the complexities of partnerships. When the answers to these questions are openly explored at the outset of project development, those participating in the discussions are equipped with an understanding of their own and each other's priorities. Even so, pursuing multiple priorities may create tension among parties. Participants identified a wide range of objectives and noted the need to navigate among economic, environmental, and socio-political ones. For instance, maximizing community capacity building through renewable energy developments may not be the most technically or economically efficient approach from the perspective of utilities but may benefit Indigenous power proponents in a multitude of ways.

Trust

Trust is paramount in building successful relationships, but distrust appears to be an overarching challenge. Many participants identified a general lack of trust in utilities among northern inhabitants due to colonial patterns of non-consensual resource

exploitation, lack of willingness to share information, and high electricity rates. Within the context of partnerships, it can be difficult for Indigenous power proponents to establish equal footing with utilities because utilities wield a comparatively large amount of political, economic, and organizational power. This is true of both private and public utilities although participants noted different struggles in each case. According to participants, overarching and partnership-specific distrust has resulted in many missed opportunities and project inefficiencies. Participants suggested that utilities could better establish trust by sharing information about their operations, and ensuring that Indigenous power proponents have the data they need for project development as well as a general understanding of utility procedures.

Engagement

Engagement was heavily emphasized and considered compulsory by many. Indigenous power proponents and utilities are only just beginning to work together after years of separate investigations into potential renewable energy projects and these new connections are being welcomed by all parties. Indigenous participants felt engagement should be initiated and maintained by utilities, with utilities adopting an even more proactive role, in advance of government urging — although there has been some progress in this area already. Utility representatives acknowledged that engagement is a new norm and there is much to learn. Indigenous power proponents suggested that utilities begin by asking about appropriate protocols to follow. Respectfully following the wishes of Indigenous governments is an important first step in correcting the power dynamics that favour utilities. Several participants also suggested that sustained engagement could lead to closer relationships where parties feel more at ease in seeking each other out and proposing joint opportunities.

Open and transparent communication

Related to engagement and trust building is the need for more open and transparent communication. This is especially true when formal business partnerships are being discussed. Indigenous power proponents have been frustrated by the lack of information sharing from utilities. Further transparency is needed around customer electricity rates, cost of diesel as it relates to power purchase prices (discussed more in Section 4.2.2) and full costing data when comparing current diesel systems to potential renewable energy systems. Participants emphasized that Indigenous power proponents should be able to access this data along with information on community energy consumption without hassle. Utilities say they would like to see more open and transparent communication as well. They are interested in hearing about potential projects at the outset of development. Having better insight into the motivations and plans of Indigenous power

proponents would help utilities make informed decisions and advance partnerships where there is mutual interest.

Ownership

Ownership has different meanings to people, and there are varying opinions on ownership types and structures. Indigenous power proponents are evaluating ownership options in relation to energy autonomy, political independence, and financial risk. For one Indigenous power proponent, full or majority equity ownership is important for reasons of energy autonomy and political independence. For others, partial equity is acceptable and in some cases, preferable, when projects pose significant financial risk. Indigenous power proponents are also considering the benefits and drawbacks of owning all the assets within a microgrid project, including generation, storage and the microgrid controller. Utilities in Yukon and NWT have insisted on owning the storage and interconnection assets for grid stability and reliability purposes and QEC is neutral at this point. Some Indigenous power proponents have taken issue with this assumption and have called for more discussion on this point.

Territorial governments are also reflecting on ownership and are considering the role of third parties. The Government of Yukon is open to the involvement on third parties but requires 50% of new IPP projects to involve First Nations as owners. The GNWT is open to the involvement of third parties in utility-scale projects but restricts third-party ownership in the case of community-scale projects. The community-owned renewable generation guidelines state that such projects must be majority owned by a community or Aboriginal government. The government of Nunavut is still in the process of developing an IPP policy but QEC has stated that it is open to third-party involvement.

Role of government

Territorial governments have different approaches to partnerships between Indigenous power proponents and utilities. The Government of Yukon is quite hands-on, providing support to those involved in PPA negotiations and acting as a facilitator between Indigenous power proponents and the private utility. In the NWT, the government has presented a particular vision for Indigenous-utility interactions in their 2030 energy strategy. This vision was informed by consultation with communities and NTPC was directed to act accordingly. The GNWT will continue to advance and support renewable energy initiatives guided by their energy strategy. In Nunavut, the government is still refining their role and in the meantime, QEC has taken the lead in liaising with communities.

Federal investment

The federal government has announced new investment into remote communities across Canada and these announcements are beginning to influence partnerships between Indigenous power proponents and utilities. Budget 2017 contains four main programs that target diesel reduction and energy security in remote communities. One of the largest is the Clean Energy for Rural and Remote Communities (CERRC) program, which allocates \$200 million over six years starting in 2018. In light of these federal investments, the Government of Yukon has encouraged Indigenous power proponents and utilities to work collaboratively on proposals to the CERRC program and those involved say that it has accelerated the partnership process.

3.2.2 Successes and barriers

The following captures the main successes and barriers collected during this research.

Successes

All participants agreed that there are far more challenges than successes at this point but nonetheless shared a few early accomplishments along with reasons for optimism.

1. Indigenous governments are demonstrating both initiative and tenacity in developing renewable energy projects.

Participants are witnessing increased interest and engagement on the part of Indigenous governments in the renewable energy sector as new projects and partnerships are proposed. Likewise, Indigenous power proponents who are several years into project development are reporting small successes in navigating complex partnership dynamics. Examples include making good use of mentors, consultants, and territorial government representatives to help navigate uncertainty, bolster their negotiation skills, and correct for power imbalances.

2. Utilities are demonstrating increased receptivity towards partnerships.

Indigenous power proponents have remarked that some utilities are starting to become more open to partnerships. In one example, it was mentioned that it was very helpful to have the utility visit the community and that this effort created a lot of good will. The willingness of Indigenous power proponents, utilities, and territorial government representatives to participate in this research also demonstrates interest, curiosity and a desire to enhance relationships all around.

3. Federal funding is more widely available.

In Budget 2017, through the Pan Canadian Framework on Clean Growth and Climate Change, federal programs specifically targeting reducing diesel in remote communities collectively represent approximately \$750 million over ten years: a source of optimism to address diesel dependency in these remote communities. The funding allocated to capacity building in remote communities has been positively received by both Indigenous communities and territorial governments but general concerns remain around the federal government’s ability to make these programs well understood, simple to understand, accessible to potential applicants and simple to apply and receive funding.

Barriers

The following barriers summarize some of the key struggles expressed by participants in regards to developing constructive working relationships. Participants identified many more specific issues but this summary outlines structural challenges felt by many.

1. Relationships between Indigenous power proponents and utilities are marked by significant distrust.

Participants discussed the lack of trust between Indigenous power proponents and utilities as an extension of the distrust that generally exists as a result of colonialism. Numerous colonial practices, past and present, continue to create conditions where it is difficult for Indigenous governments (and the members they represent) to trust potential partners. In many cases, there is a generalized distrust towards government, based on negative experiences, that also extends to utilities. In other cases, mistrust towards utilities may stem from wariness towards corporate entities whose objectives are not necessarily known, understood, or embraced. In most jurisdictions, utilities have not been in the habit of engaging customers in decisions about their local electrical systems. This historical distance leads to suspicion that utilities are harbouring ulterior motives. Some participants say that only concerted engagement on the part of the utility will bring about familiarity and trust. Others argue against the assumption of rigid divisions, since communities are also home to the employees of utilities and territorial governments. Despite these disagreements, most participants highlighted the need to address ongoing institutional and structural distrust that stymies partnerships for renewable energy projects.

2. Conflicting priorities create tension between Indigenous power proponents and utilities when discussing partnership opportunities.

Participants named a large number of reasons to deploy renewable energy projects in remote communities and highlighted the need to discuss and agree upon specific project objectives when entering into partnerships. Otherwise, unexamined priorities have the potential to create conflict as Indigenous power proponents and utilities work towards different goals. Participants suggested that the root of this barrier is not simply miscommunication but rather different accountability structures.

Indigenous power proponents and utilities report to different parties whose interests are not always compatible. Several participants noted that utilities have a range of obligations that are not necessarily apparent to IPPs who are new to the industry. Maintaining grid stability is essential, and incorporating IPPs requires confidence and experience on both sides. In terms of governance, all utilities are subject to territorial regulations, but public utilities are accountable to government and private utilities are accountable to shareholders. Participants also noted that both public and private utilities do not always grasp what it means for Indigenous representatives to act in the best interest of their communities. Indigenous participants spoke of the need to secure community approval but also referred to their role as stewards of the land, which involves caring for the many life forms that comprise and sustain their communities.

3. Indigenous power proponents and utilities struggle to agree on processes that would allow them to make swift decisions about project development.

Participants identified several moments in the development of renewable energy projects that require better processes for decision-making. In many cases, Indigenous power proponents and utilities are only just beginning to work together after years of separate investigations into potential renewable energy projects. Participants discussed the difficulty of getting on the same page after conducting different feasibility studies as well as encountering conflicting interpretations of mutually available data. At issue is not just which information to accept or reject but also what to discuss and when. Given the novelty of these arrangements, Indigenous power proponents and utilities are wrestling with the scope and timing of certain decision-making processes. Some project decisions are being reached through memoranda of understanding while others are being addressed in PPA negotiations. Participants are therefore experiencing the double challenge of trying to make use of the limited information available to them, which may be at odds with the other party's information, in the absence of established decision-making frameworks.

4. Utilities are only just beginning to adopt a culture of innovation and engagement.

All participants, but especially those from utilities, suggested that utilities must change the way they do business to accommodate broader participation in renewable energy generation. Utilities are accustomed to acting on their own, without much input from the communities they serve. Until recently, there was no formal expectation that they consult with those on the receiving end of their services. The regulations guiding utilities have focused on protecting ratepayers rather than promoting the involvement of communities and individuals in the governance of electricity systems. This legacy of regulated but largely unilateral decision-making is causing significant growing pains as new forms of energy production, distribution, and consumption emerge. Many parties are demanding that utilities be more open, responsive, and flexible, and utilities are only just beginning to learn the skills required to consult and partner accordingly.

4. Key findings – Project economics and PPAs

Creating a viable business case for renewable energy projects is one of the central challenges facing Indigenous power proponents in remote communities. There are numerous reasons why project economics are difficult to navigate in the North; securing project financing is foremost among them. Limited investment in northern projects, remoteness, and cold climate make it difficult for proponents to attract sufficient capital, all discussed in Section 2.2. Compared to renewable energy projects in grid-tied regions throughout Canada, the amount of available equity and number of interested investment firms is small and financial returns are risky. This research is interested in exploring how Indigenous power proponents and utilities might work together to overcome some of these major financial hurdles.

Participants are currently considering several types of arrangements, from legal partnerships to investment opportunities. In some cases, Indigenous power proponents are pursuing these options simultaneously. The following list summarizes the main types of arrangements and investment opportunities being pursued:

- **Legal partnership** – Indigenous power proponents and utilities formally work together and enter into a partnership agreement. The key partnership types are limited partnerships and joint ventures.
- **PPA** – Indigenous power proponents (in the form of an economic development corporation, businesses or sole proprietor) enter into legal contracts with utilities. This is a buyer / seller relationship and not a legal partnership between two entities. Nonetheless, this arrangement requires the Indigenous power proponent to set up a business in order to participate.
- **Investment** – Indigenous power proponents contribute to project financing by supplying debt and/or equity capital. The proponents are investors and are not legal partners in the project.

Keeping these potential arrangements in mind, the following section provides an overview of how participants are thinking about project economics, with special attention to PPAs as one of the most prominent financing mechanisms. We recognize that PPAs are but one aspect of renewable energy development and there are many other factors that contribute to the economic viability of projects.

We start by offering a review of existing policy frameworks for independent power producers (IPPs; the legal entity needed to form a PPA) and recent developments in each territory. We then summarize insights from current PPA negotiations and describe different views on PPA rates. We discuss some terminology around the cost of diesel generation, highlighting different interpretations of what terms like *marginal cost of diesel* and *avoided cost of diesel* mean and how these terms and the calculations behind them might inform purchase prices. Lastly, we address regulatory constraints and summarize how participants are attempting to address them.

4.1 Recent developments in territorial IPP policies

As described in Pembina’s 2016 report, *Power Purchase Policies for Remote Indigenous Communities*, there are many ways for provincial and territorial governments to incentivize the production and sale of distributed renewable energy from community- and utility-scale projects. This update on territorial IPP policies is primarily based on participant interviews rather than document analysis since distributed generation policies are only just beginning to emerge across the north. Interestingly, interviewees from all territories are thinking about IPPs but developing their own approaches and models.

4.1.1 Yukon

The Yukon is the only territory with a formal IPP policy.⁴⁴ The policy’s six objectives are to:

1. Increase electrical supply to meet future energy needs;
2. Strengthen energy security and affordability of Yukon’s electrical system;
3. Develop local electricity resources, which are renewable and/or cleaner than diesel
4. Encourage new, local economic opportunities
5. Provide Yukon First Nations with opportunities to participate in the Yukon economy, obtain economic benefits, and develop economic self-reliance

⁴⁴ Government of Yukon, *Independent Power Production Policy* (2015).
<http://www.energy.gov.yk.ca/pdf/independent-power-production-policy-201510.pdf>

6. Facilitate collaboration between public utilities and independent power producers, in the development of new clean energy supply projects, which best serve the long-term interests of Yukon consumers

To meet these objectives, the policy offers three options: a standing offer program (SOP), a call for power, and an unsolicited proposal process. Three of the territory's four isolated communities (Old Crow, Beaver Creek and Destruction Bay and Burwash Landing), are not eligible for the SOP but the policy commits the Yukon Government to working with communities and the private utility to develop community-owned IPP projects. The policy specifically aims to support economic and energy self-reliance, while reducing greenhouse gas emissions from diesel generation.

Despite the policy's overall orientation towards grid democratization, the policy has been met with some resistance, partly based on observations of B.C.'s history with IPPs and their development. Critics in Yukon have expressed concerns that the IPP policy will lead to widespread privatization and electricity rate increases. The policy does not suggest any regulatory changes that would result in rate increases but to address these concerns, the Yukon Government continues to educate the public about its intended outcomes. The policy is meant to support communities in deriving economic benefit from new energy projects rather than to usher in a wave of privatization. The government will presumably have the opportunity to clarify these objectives further given that they are in the process of updating the policy.⁴⁵

With regards to policy revisions, several participants commented on the challenges and opportunities of collaborating in a dynamic policy context. Not having a set purchase price, for example, adds to the challenge of negotiating PPAs for Indigenous power proponents. On the other hand, some participants suggested that this scenario might also facilitate policy improvements as the government observes and learns from current negotiations between First Nations and the private utility. For instance, there is nothing in the policy mandating the private utility to purchase power from remote Indigenous power proponents, so the government is considering whether the policy needs to be adjusted. For the private utility, the revisions offer a chance to better navigate a central tension in the policy, which is the difficulty of offering a consistent purchase price to power proponents without increasing rates. The Yukon Government is not prepared to comment on power purchase prices but acknowledges that power proponents would like to see rates starting at the avoided cost of diesel.

⁴⁵ When the policy was first released in 2015, it lacked certain provisions, including a purchase price for the standing offer program.

4.1.2 Northwest Territories

The GNWT does not yet have a formal IPP policy, but its recently released Draft 2030 Energy Strategy articulates the government’s intention to depart from a conventional IPP model in favour of approaches that better reflect the NWT’s energy needs. The strategy has six objectives; the first two are of particular relevance to Indigenous power proponents:

1. Work together to find solutions: community engagement, participation, and empowerment
2. Reduce greenhouse gas emissions from electricity generation in diesel communities by 25%

Under the first strategic objective, the government emphasizes its commitment to reinforce Indigenous participation in both large and community-scale energy projects. However, the strategy asserts that profit will not be permitted from community-scale projects given the high rate of subsidization required to make such projects economically viable. This is consistent with comments from interview participants on the topic of profitability in the NWT’s thermal zone. According to the GNWT, proponents in thermal zone communities should not expect market returns (to the order of 8–10%) from renewable energy projects where diesel is required as a backup because the utility itself is not permitted a market return. Furthermore, proponents are expected to work with the utility on high penetration projects unless they can offer a firm energy solution that would permit the utility to withdraw their services.

To support proponents in crafting projects that might return some profits (on the order of 3–5% rather than market levels), the GNWT has traded the language of IPPs for community-owned renewable generation and developed a set of guidelines rather than an IPP policy. The community-owned renewable generation guidelines (defined within the Draft 2030 Energy Strategy) outline the roles and responsibility of utilities and power proponents. Three of the eleven provisions are worth noting here:

- New community-scale projects must be majority owned by a local or Indigenous government, or a community organization.
- Projects must fall between 15 kW and the “community based limit,” which is the point where intermittent energy begins to destabilize the grid.⁴⁶
- Utilities will set the upper limit of renewable energy and that power proponents must reach an agreement with the utility before initiating a project.

⁴⁶ This limit, while variable and often debated, is usually around 20% of a community’s average load.

Taken together, these guidelines suggest that the government is directing utilities and power proponents to engage with each other as buyers and sellers rather than as partners in renewable projects. The utilities retain considerable control over new generation but their involvement with proponents is limited to supplying specific information and connecting projects to the grid.⁴⁷ The guidelines, however, are only intended to apply to community-scale projects and the GNWT is considering how to best promote partnerships between the utility and Indigenous power proponents for large-scale renewable energy initiatives.

For large-scale projects, the GNWT again aims to move away from an IPP model towards alternative models that foster Indigenous involvement and investment. The Inuvik wind project is one such example and is detailed under the second objective of the draft energy strategy. The objective sets a 25% reduction in GHG from electricity generation in diesel communities. Given that Inuvik uses more diesel than any other community in the territory, the government is considering installing a 2-4 MW wind project. Interview participants used the wind project to explore the benefits and drawbacks of IPP involvement in major energy projects and to describe their visions for Indigenous involvement in capital-intensive undertakings.

The GNWT believes that the public utility, NTPC, is best positioned to lead the Inuvik wind project due to the project's novelty and price tag, but is committed to seeking out partnership opportunities with Indigenous power proponents. One possibility is a low-risk investment vehicle that guarantees a set rate of return. This investment opportunity could involve a particular Indigenous government or many Indigenous governments although the GNWT has stated its preference to see as many communities benefit as possible.

Indigenous power proponents in the NWT are also considering a spectrum of involvement in large-scale projects, not just the IPP model. While the Inuvik wind project might be a risky undertaking for an IPP, it could present an interesting financing opportunity. With access to different kinds of capital, Indigenous governments are increasingly in a position to finance renewable energy projects. This approach permits Indigenous governments to participate as investors and help utilities manage their risk.

⁴⁷ The guidelines also outline the responsibilities of power proponents, the expected purchase price, and the ownership of assets.

The GNWT’s draft energy strategy will be finalized by the end of the fiscal year, April 2018, along with an Energy Action Plan that will focus on three years’ worth of investments based on bilateral agreements with the federal government.

4.1.3 Nunavut

The Government of Nunavut has not yet formulated an IPP policy but the public utility, QEC, is doing considerable foundational work in this regard. Throughout this research, QEC repeatedly emphasized its current flexibility and interest with regards to increasing distributed generation in Nunavut’s communities. QEC does not feel the need to be the only provider of electricity in the territory and they are not attached to any particular model for distributed generation. The IPP model is appealing because it helps them resolve one of their biggest challenges: limited capital. QEC would like to install renewable energy projects in several communities where positive business cases have already been developed but they must balance these investments with the need to upgrade aging infrastructure.⁴⁸

To open the grid to IPPs, QEC is currently focused on working with the territorial government to first change the Qulliq Energy Corporation Act and then develop an IPP policy. A legislative change is needed because the current Act prohibits non-QEC entities from generating power. The process to change the Act is underway and the utility expects the amendment to occur in the near future. Creating an IPP policy will be more demanding due to the inclusion of various technical provisions but the utility does not view the process as especially burdensome. It plans to take inspiration from other IPP models to create a policy that works for Nunavut by late 2018.

One of QEC’s main priorities is making the IPP process easy to navigate so that it is not overly bureaucratic for Indigenous power proponents. There are no details yet as to what the policy will contain but QEC anticipates the involvement of third parties, as in IPP models elsewhere. In response to recent interest from third parties, QEC released a framework to communicate the costs of generation and the financial considerations when evaluating renewable energy options.⁴⁹ Unlike the GNWT, QEC is indifferent about whether third parties seek a profit but they will not offer a purchase price that results in rate increases for customers.

⁴⁸ Given that QEC needs to rebuild 13 diesel plants and they have a limited borrowing ability, they are keen to pass along the capital costs of renewable energy projects to IPPs and simply purchase the electricity.

⁴⁹ QEC, *QEC Energy Framework - Generation* (2017).

https://www.qec.nu.ca/sites/default/files/341_qec_energy_framework_-_generation_may_24_2017_final.pdf

Yet with all this, QEC does not view the forthcoming IPP policy as the only solution to meeting the territory’s energy needs. The utility recognizes that the policy merely opens the door and that communities in Nunavut may not be in a position to develop projects immediately. At this point, the acquisition process is open-ended with QEC planning to gauge interest at each step of the way and make adjustments accordingly. If no proponents are ready to step forward, QEC may work with communities to issue request for proposals. QEC may also launch some of the first few renewable energy projects themselves as a way to demonstrate costs and deployment issues. QEC has already demonstrated commitment to opening the grid by announcing its new net metering program, which awaits approval from the territorial government.⁵⁰

4.2 Power purchase agreements (PPAs)

Power purchase agreements are not the only mechanism to advance renewable energy projects, but long-term PPAs are well known and used by many jurisdictions in Canada. These contracts guarantee long-term revenue for power proponents and can be used to secure financing to develop projects. Over the course of this research, however, participants noted a couple of high-level differences between PPAs in grid-tied communities and PPAs in remote communities. One of these is the difference in the PPA process. In the territories, while a few negotiations are currently underway, at the time of writing there is only one known PPA between an Indigenous power proponent and a utility: Lutsel K’e Dene First Nations and NTPC signed a PPA for a 35 kW solar installation in NWT in 2015. As such, the process for negotiating PPAs in the North is still relatively new and is being developed, contested, and formalized as Indigenous power proponents advance their projects. Another difference between PPAs in grid-tied versus remote communities is the role of capital in project economics, but this is not currently a reality in the North for most projects. Project viability still depends on large amounts of government funding.

With these distinctions in mind, we review PPA negotiations, discussions about purchase prices across the territories, and regulatory constraints that affect project economics.

⁵⁰ QEC, “Net Metering Program.” <https://www.qec.nu.ca/customer-care/net-metering-program>

4.2.1 Negotiations

Only a couple of Indigenous power proponents are currently negotiating PPAs and the processes so far have been somewhat lengthy and irregular. Given the sensitivity of these discussions, participants understandably limited their comments but graciously shared some broad considerations. Overall, participants emphasized that being among the first to negotiate PPAs in a northern context requires flexibility and perseverance in the face of unfamiliar and unpredictable circumstances. Participants spoke of having to adjust expectations and work outside of formal PPA negotiations or momentarily put aside the process altogether. Participants also raised the issue of PPA wording; some participants expressed comfort in borrowing text from PPAs in other areas, while others felt strongly that PPAs should be tailored to their context. Lastly, although PPAs are generally confidential, one Indigenous power proponent shared their intent to keep the process as open as possible so that others might learn from their experience.

4.2.2 Determining power purchase prices

One of the most difficult tasks in the PPA negotiation process is reaching a fair power purchase price that offers adequate long-term revenue to attract sufficient investment. Fair power prices are the subject of much debate; different parties have proposed different ways to calculate the operational savings and indirect savings from displacing diesel fuel with renewable energy. Consequently, there are many terms used to describe purchase prices but no consensus on this terminology. Below, we define a couple of the more commonly employed terms, namely *marginal cost of diesel* and *avoided cost of diesel*. Later in Section 5.3, we introduce a tiered approach to understanding the cost of diesel and different terms in the hopes that this framework will bring more clarity to conversations about fair purchase prices.

Marginal cost of diesel

This term is based on the commodity price of diesel fuel (which is often variable) plus transportation costs to community, service charges and any applicable taxes (including any carbon tax applied by the jurisdiction selling the fuel). Sometimes this cost is expressed as dollars per litre and sometimes it is expressed as dollars per kilowatt-hour. *The marginal cost of diesel* is also commonly referred to as the *displaced cost of diesel* or *landed cost of diesel*. All terms refer to the cost of purchasing and transporting diesel fuel. This research exclusively uses the term *marginal cost of diesel*.

Avoided cost of diesel

This term captures the *marginal cost of diesel* plus the costs of diesel system operation and maintenance (O&M), related amortization capital costs and financing-related costs. If the integration of renewable energy results in O&M savings, these would be reflected in the avoided cost of diesel. Whether the addition of a renewable energy system increases or decreases O&M costs is a complex question, depends on several factors and is very specific to each situation.

As an illustrative example, in a northern context, if a renewable energy system featuring solar PV and a battery was large enough to meet a community's entire load during a certain time of year (i.e. summer), it would be possible to completely turn off the diesel system for days or weeks at a time. As a result, the run time of the diesel generator could greatly be reduced, thereby extending the life of the system and generating savings on component wear and tear and lubricant usage.

Although outside the scope of this work, one example of negotiating power purchase prices, is the Innavik Hydro Project in Inukjuak, Quebec. Inukjuak's Pituvik Landholding Corporation has been exploring a run-of-river hydro project near their community for the past 10 years. Progress has been slow and in negotiations Hydro-Quebec has only offered a power purchase price of approximately half the *marginal cost of electricity* (about \$0.42 / kWh).

This low power purchase price means the business case cannot be made and financing cannot be raised; thus the project has not moved ahead. This exemplifies one of the main challenges facing Indigenous project proponents and project financing for advancing renewable energy projects.⁵¹

4.2.2.1 Yukon

Power purchase prices are being contemplated across the territories but the discussion is particularly lively in the Yukon, where PPAs are being actively negotiated. Indigenous power proponents in Yukon are understandably eager to obtain a price above the

⁵¹ Mariano Arriaga, "Energy Access, The Canadian Context," in Michael Brooks and Nigel Moore, *OpenAccess Energy Blueprint* (Waterloo Global Science Initiative, 2017). http://wgsi.org/sites/wgsi-live.pi.local/files/OpenAccess_Energy_Blueprint_WGSI_2017.pdf

avoided cost of diesel in order to achieve a better business case. However, the First Nations involved in negotiations are wary about insisting that O&M costs be included in the rate. In one case, significant O&M savings are not expected from the project due to its design. In the other, the proponent noted that arguing for the inclusion of O&M savings in the purchase price might prompt the utility to highlight their total cost increases and prolong negotiations unnecessarily. Likewise, the Yukon Government suggests that placing too much emphasis on precisely calculating the avoided cost of diesel by including all possible savings and increases could hinder project development and detract from the overall goal of deploying renewables.

This is not to say that participants in the Yukon intend to abandon the pursuit of fair power purchase prices, but at this point, proponents find it challenging to navigate these novel arrangements without a clear understanding of the utility's actual savings. In part, the uncertainty that characterizes these negotiations is built into the territory's IPP framework as there is no set power purchase price for renewable energy projects initiated in the three isolated communities. Proponents from these communities fall under the Unsolicited Proposals stream in the IPP policy. Participants suggested that the territorial government take a leadership role in establishing fair rates and make them a part of the IPP policy. While government representatives acknowledge the desire for fair purchase prices, it will ultimately be up to policy makers to decide how far to go beyond the marginal cost of diesel.

Another concern expressed by those in negotiations is whether today's decisions about power purchase prices might negatively impact future projects. Indigenous power proponents in the Yukon would like to set a strong precedent for other projects. One proponent shared that they would like to achieve a fair price so that the viability of future projects does not rest as heavily on obtaining further government funding, especially in the form of capital dollars. Paradoxically, recent funding announcements from the federal government may make it less likely for territorial governments to support a power purchase price above the avoided cost of diesel. Given that the value proposition of renewable energy projects is now being recognized through increased federal funding, there may be less incentive to reflect this value in PPA rates.

4.2.2.2 Northwest Territories

Unlike the Yukon, where the power purchase price for remote renewable energy projects is determined on a case-by-case basis, the GNWT has suggested that proponents in the thermal zone can expect the marginal cost of diesel for community-scale projects. In

the NWT, community-scale projects are considered between 15 kW and the community’s reliability limit. The Draft 2030 Energy Strategy asserts:

“The purchase of electricity from community-owned renewable generation must not increase rates, as set by the NWT Public Utilities Board. A generally accepted purchase price is the displaced or marginal cost of diesel taking into account generator efficiency losses and other factors.”

In simple terms, this means the utility would first assess the community’s marginal cost of diesel and offer a purchase price based on the amount of diesel fuel the renewable energy project proposes to displace. The GNWT has stated that anything above the marginal cost of diesel is an added cost in a system that cannot pay for itself. The purchase price reflects their attempt to spread the costs and benefits of electricity generation evenly across the territory’s 25 thermal zone communities. The GNWT maintains that it does not make sense to pay a premium for renewable energy in the thermal zone because of the potential impact on ratepayers across the zone. However, if proponents wish to develop a project for a different market to extend the utility’s services, then these projects would warrant a purchase price that exceeds the marginal cost of diesel. For example, higher purchase prices might be available for projects that serve mines, connect large loads, or provide firm power.

The GNWT is aware that not everyone is in favour of their community-owned renewable generation guidelines and their approach to power purchase prices. The Draft 2030 Energy Strategy is an attempt to balance conflicting viewpoints and it will undergo yet more revisions before it is released in the spring of 2018. The GNWT has been consistent, however, in its desire to manage expectations around the business case for renewable energy projects in the North so they are likely to continue emphasizing low returns for thermal zone projects.

In determining fair purchase prices, it is also worth noting that not all proponents are driven to obtain the highest possible price for their electricity. For example, Lutsel K’e Dene First Nations decided to sell power to NTPC for the marginal cost of generation by entering into PPA as an IPP rather than receiving credit for excess power through the net metering program at the retail cost of electricity. Had Lutsel K’e chosen net metering, the utility would have paid them a much higher rate. Instead, Lutsel K’e prioritized energy autonomy and community ownership over economic returns.

4.2.2.3 Nunavut

In Nunavut, QEC is only just beginning to deliberate power purchase prices for renewable energy projects because they have yet to create an IPP policy. As mentioned above, the brief document “QEC Energy Framework – Generation,” outlines the utility’s financial considerations when assessing the purchase of electricity from renewable sources. Rather than describe their costs in terms of the marginal or avoided cost of diesel, QEC explains that community rates are based on fixed and variable components. The fixed component is the combined cost of infrastructure, investments, and ongoing operations and the variable component is based on what QEC pays for diesel fuel. QEC affirms that, “the variable component is the maximum the corporation can afford to pay for renewable energy without raising electricity rates.” Elsewhere, QEC has stated that the power purchase price for renewables will likely be based on the marginal cost of diesel and may include the avoided cost of maintenance. Although the QEC Energy Framework makes no specific mention of maintenance, QEC is mindful that they may need to augment the purchase price beyond the marginal cost of diesel to attract investment. QEC will be seeking input from the territorial and federal government and others as to how to make that possible.

One of the main issues in offering a fair power purchase price is regulatory constraints. Many participants expressed frustration on the subject, bemoaning regulatory complexities that are difficult to navigate and communicate. In some cases, proponents felt that utilities were withholding information or hiding behind regulations and suggested that utilities could in fact offer fair power purchase prices. Utility representatives emphasized the difficulty of setting prices beyond the marginal cost of diesel without putting upwards pressure on electricity rates. We explore this topic in more depth below.

4.3 Regulatory constraints

As mentioned throughout this research, both private and public utilities in the territories are bound by regulations. A central feature of regulated utilities is that they cannot make decisions that result in electricity rate increases without approval from their respective territorial regulator. Requirements from regulators vary, but typically, utilities must submit General Rate Applications every two to three years containing plans for any new projects not previously approved. In the North, General Rate Applications are required to strike PPAs because of their complex regulatory implications. General Rate Applications are onerous undertakings that require a

substantial amount of time and money. Given the laborious and costly process, utilities prefer not to submit an application unless they are confident that the application will be approved.

Participants named a couple of factors that make regulatory approval difficult for renewable energy projects in remote communities. First, regulations in the North do not consider the social and environmental benefits of renewables and decisions are strictly based on cost. For example, regulatory bodies are not tasked with assessing the value of reducing GHG emissions to mitigate the effects of climate change. The federal carbon pricing framework that is coming into effect in 2018 will change this equation by increasing the operating costs of diesel systems (and hence electricity costs) although it is not clear how exactly regulators will apply the framework to their decision-making. Secondly, utilities assert that regulators are wary of approving long-term PPAs that guarantee purchase prices based on the marginal cost of diesel (or more) as diesel prices may fluctuate. If commodity prices for diesel decrease, the utility would be locked into higher energy costs. Together, these circumstances make it challenging for utilities to determine a purchase price for renewable energy that they can confidently submit to the regulator for approval.

Faced with the above regulatory constraints, participants are naturally seeking alternatives. Some suggested that regulators devise a one-time process for approving new PPAs to avoid the expense and delay of General Rate Applications although no such process currently exists in the territories. Another option put forward was securing an Order in Council, whereby the government could mandate the regulator to accept a certain purchase price for renewable energy.

However, there are reasons why governments limit the direction they provide to regulators with regards to IPPs. One of the objectives of introducing IPPs into the electricity system is integrating new generation without the hassle of establishing new utilities. By selling electricity to a regulated utility, IPPs are largely able to operate outside the bounds of a regulatory approach. If IPPs were saddled with the same obligations as utilities, they would find it difficult to succeed. And if utilities were made to purchase power from IPPs, while being subject to stringent regulations, they would have to accept a great deal of risk. The challenge at hand is finding a way to incorporate IPPs into the regulatory process without overly burdening them or the utility.

4.4 Summary

Creating a viable business case for renewable energy projects is one of the central challenges facing Indigenous power proponents in remote communities. This research investigated how utilities and Indigenous power proponents are approaching these difficult project economics with a particular emphasis on PPAs. Overall, we found that:

- IPP policies have gained traction across the territories but nonetheless differ slightly in intent.
- The process of negotiating PPAs is relatively new in the North, and all parties are struggling to determine fair power purchase prices.
- There are significant regulatory hurdles that territorial governments and utilities must address in order to facilitate PPAs with Indigenous power proponents.

Recent developments in territorial IPP policies

Numerous developments have occurred in the area of IPP policies since the release of Pembina’s report, *Power Purchase Policies for Remote Indigenous Communities*. Across the territories, Indigenous power proponents, utilities, and territorial governments are collaborating on policies to displace diesel generation with renewable energy. Yukon is the only territory with a formal IPP policy. The territorial government is actively supporting Indigenous power proponents and utilities as they develop new renewable energy projects with the goal of integrating this knowledge into future policy revisions. The GNWT has no formal IPP policy and has departed from this approach by putting forward guidelines for community-owned renewable generation through its Draft 2030 Energy Strategy. In Nunavut, there is not yet an IPP policy but QEC is doing foundational work in this regard and plans to introduce one before the end of 2018. QEC’s focus to date has been supporting legislative changes to enable the utility to purchase power from IPPs.

In Yukon and the NWT, the above policy developments are similar in their overarching goals, including energy security, economic development, and low-carbon electricity generation, as well as their aim to include Indigenous governments and organizations in the provision of new renewable power. However, the governments of these territories have devised different mechanisms to accomplish these goals. In Yukon, Indigenous power proponents in remote communities are only eligible to participate in the Unsolicited Proposals process. The territorial government has committed to work with First Nations and the private utility to develop projects in these communities. However, there are no guidelines for appropriate power purchase prices and Indigenous power proponents are struggling with this uncertainty as they negotiate PPAs. In the NWT, the

territorial government has decidedly steered away from a formal IPP policy. Instead, they conceive of Indigenous involvement in one of two ways: 1) through small-scale projects that are subject to community-owned renewable generation guidelines or 2) through large-scale projects developed by the public utility, NTPC. Importantly, they have stated that market-level profits will not be allowed in thermal zone communities. Indigenous power proponents may be able to make modest returns from community-scale projects but such projects are not being promoted by the GNWT as vehicles for economic development like they are in Yukon.

PPA negotiations and power purchase prices

PPA negotiations are a relatively recent development in the North. In the absence of relevant examples, Indigenous power proponents and utilities are tasked with breaking new ground and developing workable models. The novelty of the situation is especially burdensome for Indigenous power proponents with limited resources. Participants emphasized that the lengthy and uncertain process has required them to be highly strategic with their time and funds. One of the thorniest issues in these discussions is determining a fair power purchase price; there are several reasons behind this.

To begin, there is considerable debate about how to calculate the cost of diesel-based electricity, and therefore the value of renewable energy projects that displace a portion of diesel generation. Two of the terms most commonly employed in these debates are the marginal cost of diesel and the avoided cost of diesel.

Marginal cost of diesel – the variable commodity price of diesel fuel plus transportation costs to community, services charges and any applicable taxes. The marginal cost of diesel is also commonly referred to as the displaced cost of diesel or landed cost of diesel.

Avoided cost of diesel – the marginal cost of diesel plus the costs of diesel system operation and maintenance, related amortized capital costs, and financing-related costs.

Like IPP policies, the territorial governments approach power purchase prices differently:

- **Yukon** – Currently, the IPP policy does not guarantee any power purchase prices. The territorial government supports the avoided cost of diesel. Indigenous power proponents would like to see a purchase price that exceeds the avoided cost of diesel.

- **NWT** – In the Draft 2030 Energy Strategy, the territorial government has specified that power purchase prices for community-scale projects will be based on the marginal cost of diesel. The GNWT asserts that anything beyond the marginal cost is an added cost that the current system cannot afford. However, utility-scale projects that satisfy larger loads or provide firm power might merit higher purchase prices.
- **Nunavut** – QEC is considering power purchase prices based on the variable cost of diesel but would consider a higher price if renewables were to lower maintenance costs. The purchase price could therefore fall between the marginal and avoided cost of diesel.

To summarize, utilities across the territories are generally leaning towards power purchase prices between the marginal and avoided cost of diesel. Indigenous power proponents would like to see higher power purchase prices so that their business cases do not rest as heavily on obtaining funding from the territorial or federal governments. Yet they also recognize that utilities must navigate regulations that do not favour higher purchase prices. This issue is explored in more depth below.

Regulations

The common stumbling block faced by parties in all territories is that regulators are unlikely to approve a purchase price above the marginal cost of diesel because they do not want to saddle ratepayers with the increased costs. Northern utilities, like utilities elsewhere, are bound by regulatory approval processes that tend to restrict increases in electricity rates. Obtaining regulatory approval to integrate renewable energy in a microgrid is a lengthy and time-consuming process. Presently, general rate applications are analyzed strictly for their economic implications without consideration for the adverse impacts of diesel-based systems or the many benefits of renewables.

4.4.1 Success and barriers

Participants did not identify any notable successes with regards to project economics and PPAs apart from incremental progress on PPA negotiations. This is not to say that there have not been any successes in this area but the dearth of commentary suggests that barriers continue to dominate the discussion. The following summarizes the main barriers heard.

1. Artificially low energy prices make it challenging for renewable energy projects to compete against diesel-based systems.

A shared challenge for utilities and Indigenous power proponents is the way fossil fuel energy costs are convoluted by many means to create an artificially low price for energy. Examples include rate equalization (discussed in Section 2.4) and subsidies for diesel fuel. In this context, both utilities and proponents struggle to find a business case for renewable energy projects that can compete with subsidized conventional diesel systems. Additional government funding is required to overcome the low cost of legacy diesel systems.

2. There is little data on the true cost of renewables in the North.

Related to the above barrier, the task of weighing the business case of renewables against legacy diesel systems is challenging given the lack of integrated renewable energy projects in northern Canada and the valuable project economics and cost data behind them. There are only a handful of solar-battery systems and very few functional wind projects in the north. It is therefore difficult to determine what a competitively procured microgrid with a renewable system might cost in the territories. Additionally, each proposed renewable energy site is different, diesel systems need to be replaced at different times, and fuel costs vary. These combined issues make it difficult to build a strong business case for renewables.

3. IPP processes are not yet well established.

Both utilities and Indigenous power proponents are struggling with the novelty of independently procured renewables in the North as they navigate situations for which little policy direction exists. Many of the challenges expressed by participants come down to making tough decisions with limited resources. This is especially true for Indigenous power proponents who are hard-pressed to find examples of other Indigenous-led renewable energy projects in the North. In these cases, there is considerable uncertainty in how to negotiate with utilities and how to leverage support from the territorial and federal government. For the utilities, there has been limited direction from the territorial government with regards to IPPs until recently.

4. Agreement about the cost of diesel has been difficult to reach.

All parties expressed frustration with how the cost of diesel is being calculated and applied to power purchase prices. Indigenous power proponents note that it has been challenging to obtain information from utilities about how they determine electricity rates. Proponents would like to better understand what utilities are paying for diesel but

in the absence of direct answers, have had to extract this data from rate filing documents. As a result, they have found it difficult to assess proposed rates during PPA negotiations. Without a clear understanding of the utility's costs, proponents are uncertain whether a proposed power purchase rate is fair.

5. Current regulations deter utilities from offering fair power purchase prices.

All utilities are bound by regulations and must therefore seek regulatory approval for actions that are likely to increase rates, such as power purchase agreements with Indigenous power proponents. For these, utilities are required to submit General Rate Applications, which are financially onerous and time consuming. These applications are then judged on the basis of only their economic impact and not the social or environmental benefits they might bring through the introduction of renewable energy systems. This process deters utilities from submitting General Rate Applications and makes it difficult for utilities to justify offering power purchase prices above the marginal cost of diesel. Not until there is a change in regulations or a signal from the appropriate territorial government will utilities feel confident in offering higher PPA rates.

5. Reflections and next steps

5.1 Reflections – Partnerships

Seven themes emerged from this research with regards to partnerships between utilities and Indigenous power proponents: trust, open and transparent communication, engagement, project objectives, ownership, role of government, and federal investment. These themes may seem straightforward, but deliberate, thoughtful approaches are needed to meaningfully integrate the insights they encapsulate. It is also worth noting that there is considerable overlap between the themes. For example, open and transparent communication can help foster trust, and dedicated engagement can lead to better understanding of project objectives among partners, especially around ownership.

Overall, the research revealed a collective sense of momentum among those partnering to build renewable energy projects in remote communities. There are many reasons behind this momentum including increased alignment in economic, environmental, and socio-political goals. New federal investment is also encouraging Indigenous power proponents, territorial governments, and utilities to seek out opportunities for collaboration and cooperation. Nonetheless, there are a number of ways in which these interactions could be improved. Of particular concern is the pervasive lack of trust among parties.

Participants from all parties identified distrust as a key issue, inhibiting the formation and growth of partnerships. Distrust of utilities is widespread across the North. This wariness is the understandable product of historical and present-day inequalities that arise from colonization. As discussed earlier, many remote Indigenous communities struggle to access safe, reliable, affordable electricity services. High electricity prices and large-scale industrial developments may therefore be the only associations they have with utilities, many of which are owned by the state. Utilities are generally aware of these negative associations and have some sense of the changes required. For example, several participants noted that utilities could build trust among Indigenous communities, governments, and organizations by generally sharing more information about their operations on a regular basis and steadily working towards good relationships over time rather than expecting a warm reception immediately. Within the context of partnerships, Indigenous power proponents noted that utilities could demonstrate their trustworthiness by being more open and transparent in their

dealings. First, certain information should be easy to obtain such as data on community energy use and interconnection requirements. Second, utilities could be more forthcoming about the cost of electricity so as to facilitate PPA negotiations. These suggestions not only require utilities to communicate more frequently and generously but also compel them to fundamentally examine and transform their institutional patterns. Not only do utilities need to shift away from the long-time practice of unilateral decision-making but they must also learn to respect Indigenous self-determination and adjust their practices accordingly.

To form and sustain strong partnerships with Indigenous power proponents, utilities are being called to consider and implement a new ethos of engagement. Participants emphasized that this engagement ought to extend beyond individual partnerships and inform all of the ways in which utilities interact with remote Indigenous peoples. Crucially, utilities are being asked to listen rather than inform. Although more open and transparent community is needed from utilities, there is deeper work to be done around being attentive to the needs and wishes of Indigenous governments, organizations, and community members. The rules of engagement will necessarily differ from community to community, and utilities must be prepared to employ a collaborative vs. cookie-cutter approach. In some cases, it might be appropriate for utilities to take inspiration from international declarations or government commitments but they must also be open to the possibility of abandoning them in order to respect unique Indigenous protocols. Given the diversity of Indigenous peoples and the legacy of non-consultation among utilities in the North at large, this type of engagement will require utilities to build significant internal capacity.

Broadly speaking, Northern utilities are becoming increasingly receptive to towards partnerships with Indigenous power proponents and are taking steps to deepen their knowledge of current and prospective partners. However, there is considerable variation in the degree to which they acknowledge Indigenous authority. While Northern utilities generally recognize the value of Indigenous participation, not all of them are equally prepared to accept Indigenous leadership when it comes to new ventures. If remote renewable energy projects are to succeed, utilities as well as territorial governments will need to learn more about Indigenous aspirations and prioritize them in project development. This means that along with typical project objectives such as increasing efficiency, reducing costs, and lowering greenhouse gas emissions, it is important for utilities to consider other priorities that may be even more important to Indigenous power proponents, such as those linked to strengthening self-determination. Their objectives are not necessarily incompatible but they must be discussed. Otherwise, the lack of clarity and communication around respective goals may cause tension and

challenges. For example, several participants expressed the need for more discussion about ownership.

The research revealed numerous pressing questions about ownership that are causing delay and concern. First there is the question of how to define ownership. Participants spoke of ownership in terms of both project equity as well as system components, meaning the physical assets related to energy generation, storage, and integration. With regards to equity, some Indigenous power proponents would like full or majority ownership, while others would prefer partial ownership. The same variation applies to system components; some Indigenous power proponents have explored the possibility of owning every component of the physical system, while others are only interested in owning the generation assets. In both cases, the degree of desired ownership is strongly related to self-determination and the ways in which Indigenous power proponents choose to pursue this overarching goal.

As utilities and territorial governments impose constraints around equity and asset ownership, it is paramount that they consider the implications for Indigenous self-determination. For instance, some utilities have argued that it is important for them to own storage and interconnection assets in order to maintain grid stability. This may be true in some cases but they would do well to consider exceptions and remain flexible in the event that Indigenous power proponents express interest in owning the entire system. Such ownership may be key in achieving or reinforcing political and economic independence or it may not be relevant at all; at a minimum, all parties must have the opportunity to discuss their priorities and to correct assumptions. Conversations of this nature are best achieved in the context of ongoing engagement, in which utilities and territorial governments are truly open to Indigenous direction. As mentioned, this approach represents a significant shift away from past governance decisions and is primarily the responsibility of utilities and territorial governments.

Establishing remote renewable energy developments in the North requires dedication, problem solving, and significant resources. Projects are costly and slow compared to those in the South and there are only few examples to replicate. The complexities of such developments call for heightened investment and collaboration from all involved. Yet it is typically Indigenous governments, organizations, and communities who find themselves at the forefront of renewable energy developments. They are often asked to bear the burden of innovation and to blaze a trail with limited resources. Utilities and territorial governments thus have an important role to play in supporting Indigenous leadership along with stepping up their own involvement. With this in mind, we offer some next steps to utilities and territorial governments around partnership

development. These next steps do not include recommendations per se, as partnership types differ by territory. However, they endorse some broad areas of action that are already underway and highlight ideas that merit further attention.

5.2 Next steps – Partnerships

1) Support information sharing and relationship building among Indigenous power proponents

Indigenous power proponents in the North are very interested in learning from one another and are already participating in both formal and informal knowledge exchanges despite considerable geographic barriers. Participants emphasized that peer mentorship is helpful at every stage of project development but especially crucial in navigating working relationships with utilities. By tapping into collective experiences, Indigenous power proponents are finding ways to level the playing field.

Programs such as ARENA and Catalyst 20/20 have contributed to information sharing and relationship building among Indigenous power proponents but more opportunities are needed. Utilities and territorial governments can support these valuable interactions by connecting Indigenous power proponents to each other and by providing financial support for new and existing learning exchanges. Both the Yukon Government, through the Community Green Energy Initiative,⁵² and the NWT, through the Arctic Energy Alliance, are supporting Indigenous power proponents and this should both continue and increase.

2) Cultivate an ethos of engagement that promotes Indigenous leadership

If utilities want remote renewable energy projects to succeed, they must learn how to partner with Indigenous power proponents in a genuine manner. While utilities are generally aware of the need to shift away from unilateral decision-making, most have yet to develop a comprehensive approach to working with Indigenous peoples. Now is the moment for utilities to develop an ethos of engagement that goes beyond token involvement on specific projects to promote Indigenous leadership more broadly.

⁵² Government of Yukon – Energy, Mines and Resources Energy Branch, *Government to Government Community Green Energy Initiative*. <http://www.energy.gov.yk.ca/pdf/Community-Green-Energy-Initiative.pdf>

Participants emphasized many possible ways for utilities to promote Indigenous leadership through renewable energy partnerships. First, utilities must actively seek out Indigenous knowledge by meeting Indigenous people where they are. This means listening deeply without preconceptions or agenda. It may also mean literally meeting people on their home territory. One utility has made a habit of doing this in order to facilitate communication. Secondly, utilities need to learn how to recognize and trust Indigenous expertise and be willing to invest in visions other than their own. Thirdly, utilities must support Indigenous agency by providing Indigenous governments, organizations, and members with the information they need. This involves proactively sharing information as well as responding promptly when people have specific requests. As a first step, utilities have a crucial role to play in making visible the processes and infrastructure that power northern communities. By supporting educational events, they can both enhance energy literacy and bring more awareness to the details of their operations including important regulatory constraints. This will go a long way towards addressing the assumptions and unknowns that cause tension. Indigenous power proponents also require more transparency from utilities around electricity rates in order to advance their projects.

Developing an ethos of engagement that promotes Indigenous leadership will require a great deal of collaboration and internal capacity building on the part of utilities. It is not a linear or uniform undertaking, as it will depend greatly on the Indigenous governments and organizations with whom they interact. Territorial governments must also examine their role in these efforts. They have varying degrees of influence over utilities and in some cases are directly responsible for triggering this type of transformation. They can also act as intermediaries, encouraging utilities to engage in more meaningful ways.

3) Participate in regular gatherings with all those involved in northern renewable energy development

Utilities and territorial governments should continue participating in and supporting regular gatherings to advance remote renewable energy projects. Such events make them more accessible to Indigenous power proponents and allow them to hear important but less publicized views. These events also permit utilities and policy makers to compare approaches on emerging topics such as asset ownership and partnership agreements. Conferences like Pembina's ongoing Renewable in Remote Communities series and the Indigenous Clean Energy Network Gathering that is happening in October 2018 are good examples of powerful convening opportunities.

4) Ensure that funding available for remote renewable energy projects is easily accessible to Indigenous power proponents

Recent federal investment in remote renewable energy projects has generally encouraged utilities, territorial governments, and Indigenous power proponents to work more closely. However, this substantial increase in funding and programs has been made through a series of relatively uncoordinated announcements that can be difficult to sort through. It is also difficult to understand how much funding is being directly allocated to Indigenous communities compared to territorial governments, utilities or others. The federal government should simplify these funding opportunities and streamline their communication methods. A variety of tactics such as infographics and frequent updates should be used to communicate the details about program eligibility, timing of available funding, application requirements, and how different programs can be used together.

5) Support knowledge creation that documents lessons learned and investigates emerging issues such as ownership

Given the novelty of remote renewable energy projects, both Indigenous power proponents and utilities would benefit from new resource materials on a variety of topics. Therefore, along with relationship building and information sharing, we highlight the need for knowledge creation that serves their emerging interests. By knowledge creation, we mean collaborative research that assists Indigenous power proponents and utilities learn what they need to know in order to create and sustain better partnerships. Two potential research avenues arise from discussions with participants.

The first is an ongoing synthesis of lessons of learned that would draw upon the rich experiences of Indigenous power proponents over the last few years. Although there are a few documents addressed to Indigenous power proponents, they are largely based on grid-connected projects. This research focus would therefore provide a much-needed perspective on remote Northern developments and enhance existing information and exchanges. Documents within this area of focus could include resource guides and in-depth case studies of completed projects.

The second proposes investigations into pressing questions as they arise. Ownership is one example of an emerging issue deserving more attention. Research into ownership could review existing ownership arrangements as well as more dynamic, participatory methods. Given how difficult it can be to navigate ownership questions individually, it would be helpful to convene utilities and Indigenous power proponents to openly

explore the benefits and drawbacks of different ownership models including both equity and physical assets (energy generation, storage, and micro-controller).

Regardless of the precise topics, it is important to continue investing in knowledge creation that moves beyond technical questions. The socio-political aspects of remote renewable energy development are just as crucial to the success of these projects but are so far under-researched. Additionally, these activities must be sensitive to Indigenous research priorities and strive to reverse and repair exploitative research practices. For this reason, research about Indigenous peoples is best designed and conducted by Indigenous practitioners and scholars.

5.3 Reflections – Project economics and PPAs

The economics of renewable energy projects in North are difficult due to geography, remoteness, climate, and renewable resource availability. As a source of long-term revenue, PPAs are one way to improve project economics and reduce reliance on government granting programs. Several territorial governments are therefore introducing measures to support PPAs by implementing IPP policies. Such policies are gaining traction in both Yukon and Nunavut. The Government of Yukon is preparing to implement a revised IPP policy and the Government of Nunavut has amended the Qulliq Energy Corporation Act to allow for the development of an IPP policy. The Government of Northwest Territories has taken a slightly different approach; they are developing strategies around community generation but choosing not to use the term IPP.

With the introduction of IPP policies in the North come interesting questions around privatization and profit. With regards to privatization, it is sometimes assumed that IPP policies are meant to facilitate privatization but this is not necessarily the case in the context of remote renewable energy developments. The Government of Yukon, for example, has quite clearly attempted to dissociate its IPP policy from the ideological underpinnings of privatization. Rather than offloading government responsibility to the private sector, they have framed the IPP policy as a way to support inclusive economic development. However, this approach is not always well understood and has at times elicited political backlash (in other jurisdictions outside the territories – most noticeably, IPP privatization at BC Hydro over the years). The situation prompts the question of how territorial governments ought to go about securing social license for IPP policies so that new actors, like Indigenous power proponents, are able to develop viable renewable energy projects.

All territorial governments are wrestling with the challenge of incentivizing investment in remote renewable energy projects without raising electricity rates. The Government of Yukon and QEC are open to IPPs reaping financial benefits from such projects if they are able. In other words, IPPs are welcome to pursue profit-generating innovations but they are still subject to the difficult economic realities of Northern renewable energy development. The GNWT has taken the position, however, that market-level returns will not be permitted within the thermal zone as energy generation is already heavily subsidized in these communities. The Government has therefore directed NTPC to implement a set of community generation guidelines to dissuade third parties from pursuing profit-driven projects while encouraging Indigenous power proponents, among others, to develop projects with modest returns. It is not yet clear how these divergent approaches compare in terms of supporting an emerging renewable sector as it remains challenging to attract private investment without putting upwards pressure on electricity rates. This tension is especially present in discussions about PPA rates.

PPA rates

Discussions about PPA rates lack consistency due to varying definitions around marginal cost of diesel, the avoided cost of diesel, and other common terms. More work is needed to gain consensus around these terms and how they relate to a fair PPA rate. However, many agree that at a minimum, the PPA rate should reflect the marginal cost of diesel and that utilities ought to be more transparent about how they calculate this amount.

One way to strengthen the economics of a project is to offer a PPA rate above the marginal cost of energy, closer to the avoided cost of energy. This rate would take into account potential savings from reduced operations and maintenance costs associated with diesel-based systems. Offering PPA rates that are based on more than the avoided cost of energy would produce an even greater shift that recognizes the environmental, economic and social cost savings associated with renewable energy resources and the subsidization applied to diesel systems. The complex challenges of offering PPA rates beyond marginal cost of diesel (mostly the economic bottom line analysis and the restrictions of increasing electricity costs to consumers) are understood but only strengthen the need for innovative regulatory solutions to this problem.

Framework to advance fair PPA rates

To help advance thinking around increasing PPA rates beyond the marginal and avoided cost of energy, we present a new framework in Figure 2. This framework is meant to offer common language around the cost of diesel to facilitate future conversations.

Along with the marginal and avoided cost of energy definitions, a third tier, the *true cost of energy*, is presented as an attempt to incorporate costs associated with diesel fuel that are not currently included as well as subsidies applied to diesel fuel and electricity pricing in remote communities. Externalized costs include costs associated with diesel contamination, environmental and health costs associated with combustion of fossil fuels (particulate matter and other air contaminants), and social costs associated with dependency on imported fossil fuels and combustion of these fuels.

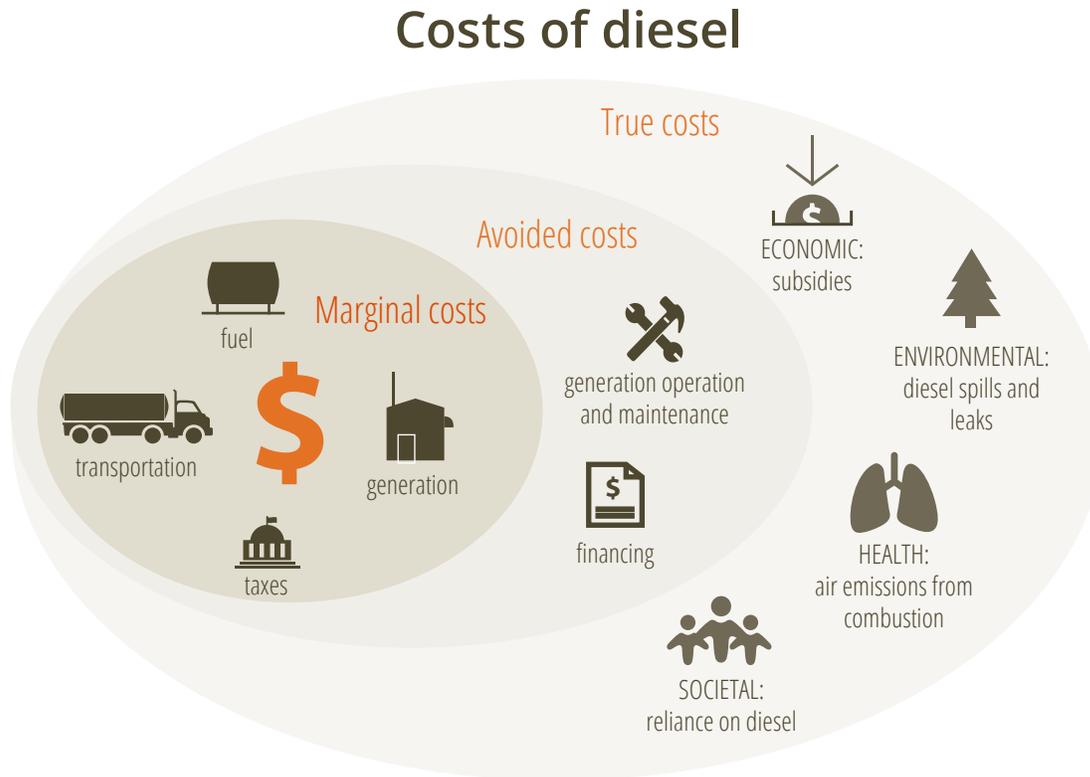


Figure 2. Suggested framework to support fair PPA rate negotiation

Transforming diesel subsidies into clean energy incentives

To add a further layer of complexity, there is growing awareness that the cost of energy is highly subsidized by various mechanisms and the true cost of energy is much higher than the marginal cost of energy. We have alluded to these subsidies but have not examined them so it is worth briefly noting other research on the topic. Recent research conducted by WWF Canada tracks the significant number of subsidies that are required to sustain diesel-based systems in Nunavut.⁵³ The research speaks to the high cost of

⁵³ *Costing Energy and Fossil Fuel Subsidies in Nunavut.*

diesel-based electricity to the government of Nunavut and raises important considerations around the continued cost to governments and the economic liabilities posed by diesel-based systems. Potential cost savings of transitioning to renewable energy systems could be considered when negotiating PPA rates. The notion is that if renewable energy system integration continues and there is less reliance and consumption of diesel, then the current spending on subsidies could be shifted towards financing renewable energy systems.

The true cost of energy should be a key metric to use when negotiating fair PPA rates.

Regulatory constraints

Regulatory constraints were identified as a key barrier restricting fair PPA rates. Both private and public utilities in the territories are bound by regulations and as such are not permitted to act in ways that would increase electricity rates without prior approval. One of the issues that utilities have identified in seeking approval for remote renewable energy projects is the narrow basis on which regulatory decisions are made. Currently, general rate applications are only assessed using economic measures rather than a broader set of criteria that accounts for social and environmental concerns. Under these circumstances, it is difficult to justify any new capital expenditures, especially renewable energy systems, which appear to cost more than heavily subsidized diesel-based systems. If the social and environmental merits of renewable energy projects are to be considered as well, regulations must change accordingly. It is not yet clear how to drive this innovation but there are examples in other jurisdictions that demonstrate promise in terms of empowering regulatory bodies to broaden their decision-making. For instance, the Ontario Ministry of Energy issued a provincial directive to the regulator to consider the social benefits of a renewable energy project to Whitesand First Nation.⁵⁴ The directive was helpful to them in negotiating a PPA rate above the marginal cost of diesel.

⁵⁴ The MoE Directive is available at www.ieso.ca/-/media/files/ieso/document-library/ministerial-directives/2015/directive-nug-chpsop-20151214.pdf?la=en. The Ministry released this provincial directive exercising its statutory power of ministerial direction to the Independent Electricity System Operator (IESO) under the 1998 Electricity Act.

5.4 Next steps – Project economics and PPA

Although much work is being done to improve project economics across the territories, more reflection and action is needed from all involved. The following next steps outline some areas that require either continued effort or new attention.

1. Ensure Indigenous involvement in the implementation of IPP policies

As territorial governments implement their respective IPP policies, they should continue working with Indigenous governments and organizations to ensure that Indigenous involvement is prioritized. In April 2018, the GNWT finalized its 2030 Energy Strategy as well as a Climate and Energy Action Plan that will focus on three years' worth of investments based on bilateral agreements with the federal government. The Government of Yukon is expecting to finalize and put its IPP policy through legislation by early 2019. The Government of Nunavut is moving towards an IPP policy in 2019. Implementation of these policies is an extremely important aspect of this work and should be monitored to ensure policies are upheld and indeed result in new Indigenous-led power projects.

2. Get widespread consensus on how to calculate the cost of energy

Convene all major actors involved in Northern renewable energy developments with the goals of ensuring that terms such as marginal cost of energy and avoided cost of energy are rooted in a set of common understandings, and transforming these discussion into material that can be used to guide PPA negotiations. Having utilities provide evidence of their marginal cost of energy would be a helpful starting point.

3. Conduct further research into the costs of remote renewable energy systems

More information on the life cycle costs of remote renewable energy projects in the North is needed. A number of projects have been installed over the past few years and these would provide good data on project costs. This information is needed so comparisons can be made between renewable energy systems and legacy diesel systems. Even though the majority of projects have drawn upon federal and territorial funding, they can still provide important insights into project development costs.

4. Research diesel subsidies

Further research is needed on the subsidies applied to diesel systems, including the different types, amounts, and how they flow from the federal government to provincial/territorial governments to utilities and ratepayers. The federal government has commissioned research into this work. Once this research is complete, they should share this information publically and if further insight is needed, conduct further research. The subject of subsidies is complex with significant jurisdictional differences but insights into this subsidy system are crucial for major breakthroughs.

5. Explore regulatory innovations to advance fair PPA rates and support Indigenous power proponents

Convene utilities, regulators, and policy makers to brainstorm regulatory innovations to support remote renewable energy projects. Utilities argue that they are constrained by current regulations that prioritize economic considerations above all else and that such regulations do not allow them to offer higher PPA rates for renewable energy. This claim should be examined in more depth and changes investigated that would allow regulators to include additional factors in their decision-making. Another point for discussion is the process by which PPAs are approved. Rather than relying on general rate applications, which are cumbersome and costly, perhaps there is a way to expedite the approval of PPAs involving Indigenous power proponents.

6. Develop PPA negotiation framework

A PPA negotiation framework should be developed that is based on experiences gained and lessons learned over the past few years to provide guidance to both utilities and Indigenous power proponents around navigating the PPA negotiation process. This framework could also include knowledge gained from the other next steps. For example, it could contain general agreements about how to calculate the marginal and avoided cost of energy and new research findings into the cost of renewable energy systems.