

KIVALLIQ ENERGY FORUM
DECEMBER 2 - 5, 2019
RANKIN INLET

KIVALLIQ ENERGY FORUM

FINAL REPORT



The Kivalliq Chamber of Commerce hosted the **Kivalliq Energy Forum - December 2nd to 5th, 2019** at the Siniktarvik Hotel in Rankin Inlet, Nunavut.

This conference began on Monday, December 2nd with a Meet and Greet at the Siniktarvik Hotel. With just over 50 attendees, sessions through the week featured presentations about Renewable Energy options, panel discussions, best practices and funding opportunities. Thursday afternoon was reserved for engaging the local community with an Open House about renewable energy options.

The Kivalliq Energy Forum enabled better communication between all stakeholders and provided knowledge-sharing of renewable energy options, and case studies to aid in educating participants on what's possible in terms of different energy options, funding programs for renewable projects and how to move towards putting in place more alternative energy systems for Kivallirmiut.

BACKGROUND

Renewable energy is an emerging market in Nunavut with the potential to decrease economic leakage through the use of local, renewable energy sources. Reducing diesel dependence can lower energy costs, increase local employment, and enable Inuit ownership and returns from these projects. The Arctic is at the forefront of climate change, and renewable energy technologies are a crucial tool in making our communities more sustainable, environmentally-friendly, and self-sufficient. Many communities, businesses, and individuals are interested in learning more about renewable energy opportunities, challenges, programs, and policies in Nunavut. The Forum gathered experts in renewable energy to present and participate in panel discussions with representatives from the Kivalliq regions' hamlets and Hunters and Trappers Association to ultimately assist in moving renewable energy projects forward in the Kivalliq region.

Over the past year, numerous renewable energy private development companies have approached Kivalliq companies and Hamlets to interest them in participating in energy projects.

Changes to Qulliq Energy Corporation's (QEC) legislation, both net metering and the upcoming Independent Power Producer (IPP) options, also need to be better understood by community members and local businesses to see how they can be made use of in a way that truly works for communities. This forum did just this, and included presentation from QEC about their net-metering and IPP options coming on-stream in 2020.

The Kivalliq Chamber of Commerce, in partnership with Government of Nunavut Climate Change Secretariat, WWF-Canada and Government of Nunavut's Department of Economic Development and Transportation all participated as committee members to develop, identify speakers, and format the schedule for the first Kivalliq Energy Forum.

Organizing committee members included, Patrick Tagoona, President of Kivalliq Chamber of Commerce, Martha Lenio, WWF-Canada, Andreane Lussier and Tooma Natsiq from GN – Climate Change Secretariat, Robert Connelly and David Fredlund from GN-Department of Economic Development & Transportation. Two coordinators, Brenda Mercer (Mercer Business Support Services) and Keith Collier provided pre-conference coordination & logistics, onsite and note-taking services.



FORUM OVERVIEW

The Forum began by educating participants about Renewable Energy options for the Arctic, and then heard from professionals who shared their experience and knowledge about renewable projects in the Arctic and specifically in the Kivalliq. Participants also heard from Federal, Territorial, and Municipal agencies about funding programs to support green energies.

Each session was followed by a panel that included the session speakers.

Periodic breaks and social events provided time for delegates to network and have side discussions about renewable energy options for their region and communities.

The following is a detailed account of the Q&A after each presentation and subsequent panel discussions.



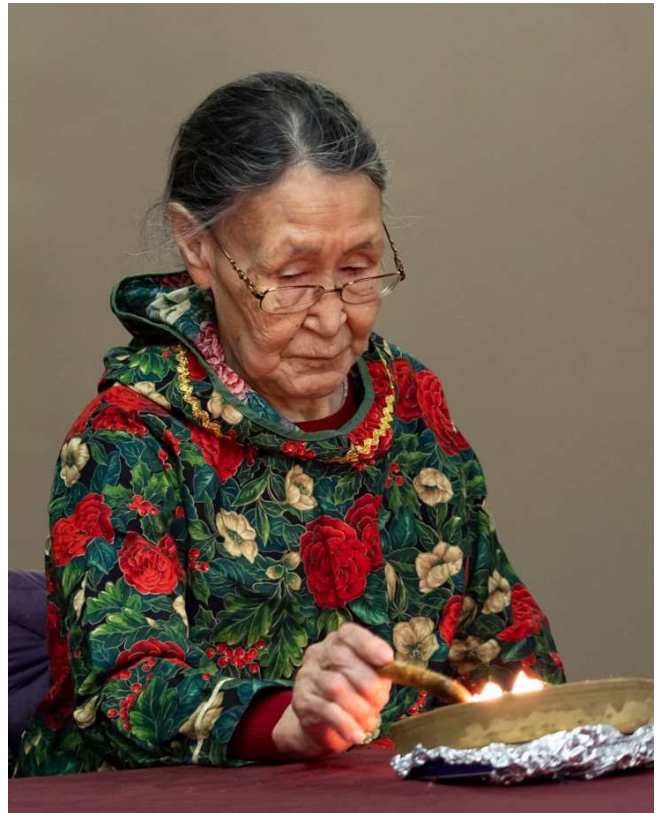
OVERVIEW DAY ONE

Tuesday December 3rd:

The Forum was opened with a Qulliq lighting by respected Rankin Inlet elder, Mrs. Tattuinee. Ms Tattuinee spoke about the Qulliq and its importance in Inuit culture; Not only did the Qulliq provide light, but it also provided heat to warm those in the iglu or sod house as well to dry wet clothes. Elder Tattuinee encouraged participants to learn about renewable energy and to have a productive meeting.

Patrick Tagoona, President of Kivalliq Chamber of Commerce and host of the Kivalliq Energy Forum welcomed and acknowledged all those in attendance for taking the time to participate in the Forum.

The first presentation, Partnerships First: Remote Clean Energy Microgrids, was presented by Shivani Chotalia, Manager, Engineering & Community Partnerships, NRStor & Scott Matthews, Vice President - Projects, NRStor. (Note: links to all presentation can be found at www.kivalliqenergyforum.ca).



POST PRESENTATION Q&A:

1. Does the project require NIRB screening?
 - a. The wind portion of the project will need to go through NIRB screening.
2. What are the jobs and training required to work on this project?
 - a. NRStor is hiring and training local residents for the construction of the project. For operations and ongoing maintenance 2 to 3 local people are to be trained for these jobs.



3. **How does this project keep the batteries warm?**
 - a. NRStor is working with suppliers to make sure battery containers are properly designed for extreme climates.
4. **What size of batteries?**
 - a. For Arviat’s project, they are 2 MW / 2 MWh (power and energy ratings) –about the size of 2 large sea cans.
5. **What was the process for selecting the site and collecting data?**
 - a. This is an extremely important piece of the project. This was a collaborative process, NRStor worked with the Hamlet and HTO to identify sites.
6. **Do solar panels operate in extreme cold?**
 - a. Yes. Using something called “bifacial” solar panels means they capture light to produce energy from both the front and back. This means they can capture light from snow reflection, and it helps any snow on the front of the panel to melt. Solar is not strong in the winter but is very strong in the summer. The cold temperatures will not stop the solar.
 - b. In terms of wind power, there are heating packages to melt the ice and make sure it doesn’t build up.
7. **Who owns the project?**
 - a. Project ownership will be close to 50%-50% split – Hamlet of Arviat / NRStor.

8. **NIRB is working closely with Nunavut Planning Commission, advice from NIRB is to start the process early and then determine what you need.**
9. **Before you install the MET Tower did community members give their opinion?**
 - a. Yes, we had various meetings with hamlet council, and Arviat HTO.



The second presentation, Solar Energy 101 Technology & Old Crow Solar Project, was given by Ben Power, Vice President, Solvest.

POST-PRESENTATION Q&A:

- a. **What is the level of battery storage at the Old Crow site?**
 - a. 500 kW for power, 500 kWh for energy.
- b. **What is the size of the Old Crow population?**
 - a. About 380 people, quite a bit smaller than Rankin Inlet.
- c. **Does it stop working at -30C?**
 - a. Bi-facial models stop producing enough power to melt the snow on the front; wind does not affect the solar panels.
- d. **Solar panels come in sections – how much power from each section?**
 - a. Solar modules are 350-450 watts per panel – how many you need on a cabin depends on how much power your cabin uses.
- e. **Can NRStor give preference for ground mounted vs roof-mounted systems?**
 - a. NRStor and the Hamlet decided on a ground mounted system for a few different reasons. One reason is that it can be hard to make sure roofs are structurally sound and able to hold the solar panels.
- f. **For the Arviat project, since project is near the sewage lagoon, are you worried about wildlife damaging the panels – specifically polar bears?**
 - a. We are working with the Hamlet to protect the panels from wildlife.
- g. **Are ravens and brown bears an issue for solar panels?**
 - a. For the Old Crow project, bird spikes (2" spikes) were installed on the panels, birds won't sit there with these spikes. A fence around the panels can be used to keep wildlife out.
- h. **What is the potential for solar thermal?**
 - a. Solar thermal is underappreciated and works in the North. There are 2 projects in southern NWT, generating 50% of their hot water needs from solar thermal. It doesn't work well in because there is little sunlight.



Bill Williams, former EDO, Kugluktuk, and now Executive Director of the Nunavut Economic Developers Association (NEDA) gave the third presentation in the morning: “Is Energy the Solution?” Kugluktuk Energy Projects.

POST-PRESENTATION Q&A:

1. How much money did the recreation centre save after the solar panels were installed?
 - a. The savings are about \$50K a year. A community’s recreation centre is one of the biggest energy users.

PANEL DISCUSSION: ENERGY 101 AND LESSONS LEARNED

Moderator: Martha Lenio (WWF-Canada)

1. What are some of the environmental impacts – what are the end of life issues for solar projects?
 - a. End of life consideration should be included in financial plans; build in a decommissioning (clean-up) plan. With respect to batteries, vendors will take back the lithium batteries, they fall into 2 categories: either second life batteries, or recycled for other materials. Can convert them into smaller batteries, i.e.: watch batteries.
2. How long will solar panels last?
 - a. Solar panels last for 25 to 30 years. Even after 30 years they still work but with less energy generation. Most are recyclable – in the Old Crow project there is budgeting for end of life clean-up or fix-up.

3. Put decommissioning into the project requirements. Look at backhaul with sealift.
4. Decommissioning has become part of the process for these projects in the States. Companies must put up a letter of credit for the clean-up money that is good for 20 years.
5. How long does a wind turbine last?
 - a. Wind turbine life can be extended by replacing parts. A lot of the turbine can be recycled at the end of its life.
6. How can communities get ownership?
 - a. If the hamlet is the project leader then it is a hamlet asset. For larger projects it is good to have financial and/or indigenous partners.
 - b. Old Crow made a community decision that project was to be 100% community owned. They looked for funding partners to support that decision.
 - c. For NRStor and Arviat, having a high level of community ownership is important for project success. Arviat received Federal funding to give the community ownership without paying anything out of pocket. As a private partner NRStor is paying for project costs so they can share ownership and have a return on investment .



7. **What do you do to maintain trust in the community?**
 - a. NRStor has been able to develop a good partnership through regular communication and ongoing work with the Hamlet. The success of the relationship is a testament to the Hamlet's leadership on bringing clean energy to their community.
8. **Is NRStor interested in other projects outside of Arviat? Is anyone interested generating power from rivers?**
 - a. Yes, NRStor is interested in bringing this model to other communities and we would like to do more than one-off projects. There will be a pathway to move forward on projects like this across Nunavut when QEC's IPP program is launched. For hydro power, it is very dependent on the specific community and what renewable resources they have available locally. It's about taking advantage of the renewable energy available in each community, and what the community would like to see.
9. **Before looking at any projects, determine what solutions you are trying to get that energy for. Start with a Community Energy Plan (CEP). This CEP addresses community concerns and what's acceptable.**
10. **We would be interested in this for Coral Harbour, but often we have storms that can last up to 3 days. What happens if there is a 3 day storm?**
 - a. The designs can take into account storm patterns and snow levels to ensure equipment can work even in the worst conditions. In terms of power outages – there are many reasons. Overhead lines can be affected regardless of the type of power stations.
11. **With respect to other energy sources, Polar Knowledge Canada is looking at High Arctic communities and plans to also look at tidal resources. The federal government is looking at this as well.**
12. **What would wind turbines be rated to for temperature and windspeed?**
 - a. It is important to measure the wind speed at the site, and choose the right turbine based on those speeds. In Arviat, NRStor is working with suppliers to ensure the turbines will work down to extreme cold temperatures and include features like blade heating. The turbines also have braking systems so they will stop producing power if the wind speed is too strong. Electronic components are not affected by wind chill.
13. **What about regulations? In terms of the Land Claim agreement, are there any requirements for NIRB that need to be satisfied for wind mills or for solar panels?**
 - a. It depends on the project. If solar panels are on a roof, you need structural drawings to ensure the roof can handle the weight. You also need to work with QEC to ensure you meet the grid requirements. For wind turbines, talk to NIRB.
 - b. If NIRB could state what communities can expect so these can be included in the projects. For Old Crow, site selection, community consultation, and use of land, the project went through the Yukon Environment Assessment Board.

- c. For the Arviat project, information was submitted to NPC. Although the project is all located on Hamlet lands, NPC determined that the wind portion of the project should go through NIRB screening. The solar portion was not required to go through NIRB.
 - d. NIRB response: it depends on where the project is happening. Solar panels have less of an impact. So NPC did not require NIRB Assessment for the solar project, but for wind project it does need to go through the NIRB process. This is especially if there are community concerns.
 - e. Consultation with community is the key to these projects. It typically takes 8 to 12 months to review and hold community consultations. Community consultation is key.
- 14. Communities are interested but would like to see a model [of the renewable energy project] when you come to community to better understand how it works. This will help the community understand more.
 - 15. For the wind turbines, when is that project going to be done and how many jobs will come out of it.
 - a. It will take two seasons to complete the construction. It is planned to be completed in 2021 although timelines are also tied to the launch of QEC's IPP program. We are anticipating about 10-15 jobs for wind construction and about 2-3 jobs for the ongoing operations.
 - 16. Recommend starting with a community energy plan to determine how to move forward with a renewable energy project.



Our first afternoon speaker, Pierre Rivard, presented Glencore RAGLAN Mine Case Study – “TUGLIQ’s Lessons Learnt in Renewable Energy and Energy Storage”.

POST-PRESENTATION Q&A:

1. Were there any impacts to caribou or local wildlife from your project?
 - a. We find maybe 2 dead birds a year. The design was based around the migration route of birds, and was done through research. What we find on the ground we hope are true numbers unless any fox take the dead birds. Bats are an issue in the South; the wind turbine blades create a pressure drop when they move, which causes bats lungs to collapse. This can kill hundreds of bats. We do not see bats in the north, but they are starting to migrate north because of climate change. We also changed the proposed turbine location after community consultation to stay away from traditional fishing areas to make sure there was no impact on fish.

2. How do you monitor that it is a good project?
 - a. Factor in traditional knowledge; reports must be done by the developer to show there is no impact on wildlife. You have the right to your land.



The second afternoon presentation, “Capacity Building for Remote Arctic Communities - the Arctic Remote Energy Network Academy “, was presented by Robert Cooke, Team Leader, Clean Energy and Infrastructure, Polar Knowledge.

Questions and answers for Robert Cooke were included in the panel discussion at the end of Tuesday afternoon presentations.

The final presentation of the afternoon was delivered by Jackson Lindell of JL Repair Solar Power Sales.

Jackson spoke without a PowerPoint presentation, below is the summary of his presentation.

Jackson is a Rankin resident. Jackson has his own small engine repair shop and is a small engine mechanic. He has learned about solar / renewable energy from the internet and You Tube videos. He’s a hands-on learner and now has firsthand experience on how to install a solar panel at a cabin. He has found the process interesting and notes it’s cheaper than typical diesel fuel systems. He “harvests” the solar power from springtime to fall. Jackson has developed a “starter package” for cabin owners. Jackson described how solar panels work, and how they convert solar energy to DC power. Jackson cautioned the key is

to not overcharge the batteries. The package sells for about \$1500 and that the most expensive part is the battery. Cabin owners just have to learn you only have a limited amount of electricity – so we don’t waste it. Cabin life forces you to become more efficient, and hence your consumption lowers. As well you start to find and use products that are more efficient which in turn makes you more mindful of resources. Financially over a couple of years, you are using less and not burning fossil fuels to charge an iPod. The key is to start small. Learn the system and appreciate the functionality of it. Once you appreciate a small idea like this, then you can apply it to your home. If you know your energy demands, then you can decide what size of system you need.

Jackson illustrated the formula for determining your energy consumption for a year and then how many panels that would translate to for a home.

The important part before doing any conversion to solar power is doing your homework to understand if it is worth it or not and finding the people who can help you figure these things out.



POST-PRESENTATION Q&A:

1. How many solar panels do you have on your cabin?
 - a. Two 25-watt panels = 50 watts; it's a slow charge for the battery. As long as the batteries aren't covered in snow, they're okay in the winter. The batteries don't freeze as there is always a slow charge. For the search and rescue cabins this would be a good system to have in those cabins. Applications are endless for up here. It's not really energy efficient to heat the battery due to wattage required for heating.
2. You are telling us there is free power! A letter to KIA to fund this kind of project for Search and Rescue cabins would be a good idea. It's a relatively new concept in the north, but it seems like a no-brainer. If you combine solar and wind turbines, springtime is always sunny and it's always windy here. It's free power! Spend the money upfront and it quickly pays off, feels good to be able to say we don't have to use diesel.
3. How much is system?
 - a. About \$1500, hardest part is getting the batteries up here.
4. HTO and Search & Rescue are often lacking financially, so how could you work with them to purchase these systems?
 - a. There are a lot of system available online, Amazon, EBay. Really efficient packages available – email or call me and I will help.


5. Referring to the panel Jackson brought into the venue the question is asked “is this real life size?”
 - a. Yes, but you can also get different sizes.
6. What can they power?
 - a. The more batteries you have the more energy storage you have. Depends on your consumption how much you need. You can always add to these systems.



PANEL DISCUSSIONS - CAPACITY BUILDING & LESSONS LEARNED Q&A:

Note: Green Sun Rising (Klaus Dohring) and Powertec Solar (Kent Heinrich) joined the panel

1. Sometimes projects get hung up and don't happen. Are there abandoned projects in the north?
 - a. When the electrical code changes, that requires newer technologies. Usually mounting can be reused, but DC wiring codes changed so we have to replace that. Structural engineering and permits from the utility are needed. Then the system needs to undergo the electrical inspection, which can be based on photographic evidence. Considerable procedural process involved.
2. For a large wind energy project at a mine, when the mine's life is over, the community has that wind power source available to them. Solar panels from Iqaluit had more years of service in the north vs. in the south. There can be a second life for these. We can learn from Inuit culture, to reuse all the parts from renewable energy products.
3. What are the challenges with starting up solar power projects?
 - a. Just learning about solar power in general, and reading books or online, the how-to's – i.e.) Solar 101. Gaining that knowledge has been the hardest part, if you haven't gone to school, it was learning and absorbing what you read. People can get discouraged – you need to be persistent to get it. Financially, it's not too bad; it's the batteries, it costs a lot to bring in batteries. That is the most expensive part. Learning how to take care of the batteries and getting them up to the north is one of the challenges.
4. With respect to financing a renewable project, they cost a lot to get up and running. What are the big things to keep in mind in order to get capital?
 - a. There is grant money available to municipalities. Arenas are the biggest consumers of energy in a Community. For a residential home-owner, two-thirds of their electrical is subsidized so then solar takes a back seat. If electricity is not subsidized then solar is more attractive. Logistics costs and permits are expensive. Larger solar projects will be more cost effective. You can bundle several projects together so the logistics can be cheaper.
 - b. There are debt and equity components to financing. Find locally generated projects. Try to create a circular economy. Essentially try to maximize local economy engagement.

5. **What kind of noise would be generated from wind turbines and what may be impact on wildlife?**
 - a. The further away from the turbine, the less noise. Essentially 2 km away can't hear any noise. It's all about planning the site properly. For the wildlife, communities need to have a community energy plan that includes renewable energy, and mix and match solar and wind to try to minimize the impacts on wildlife. Compared to diesel renewable energy is better for the environment.
 6. **Are you seeing a more balanced approach from arctic communities and not favoring just one type of renewable energy program?**
 - a. Yes, wind / storage / solar hybrid, is what we are seeing. We are learning a lot from biomass technology – shouldn't just focus on one type of energy. As the earth heats up there may be more opportunity for tidal energy.
 7. **What is in the solar panel?**
 - a. On the front are solar cells, the metal lines are silver. The thicker strips are copper ribbons plated with tin. The ribbon is soldered onto the silver on the solar cell.
 8. **A comment on recycling – the mounting system is easiest. The inverter, kind of like a computer, has electronics; they will take it apart and reuse parts. The plastic gets burned off. The majority of the solar panel is glass, and then aluminum, then the junction box and wiring. Inside solar cells there are some materials that are hazardous. Do not burn, but rather ship them back south, by then Canada will have an established recycling program.**
 9. **What are waste technologies?**
 - a. This technology is used in cruise ships. Waste-to-energy (heat), essentially you burn waste and use the heat. The char/ solid waste can be used as fertilizer in agriculture. Another circular economy example. Position the burner close to the user of the heat. Use the heat to do hot water production for arenas, pools, somewhere you have a constant need for heat.
 10. **Are there any last thoughts you would like to leave with the audience?**
 - a. Don't wait for a perfect plan, just get going and improve as you go along.
 - b. Look at all the tools in the toolbox. Solar is quick and doable. Because of the seasonality of the climate, you can use a mix of tools.
 - c. Renewable energy is an industry. For a place that doesn't have a variety of industries, renewable energy is a great opportunity to enter into, and we need to take advantage of creatively applying technology to fit our communities – understanding and coming up with products for the north.
 - d. Projects that succeed are projects that the communities want. Getting young people involved in these programs is imperative.
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OVERVIEW DAY TWO

Wednesday December 4th

Robert Connelly welcomed delegates back to Day Two of the Kivalliq Energy Forum. Robert provided words of thanks and recognition to our translators (Maryrose Angoshadluk and Donna Adams). Robert also provided details about Community Tour of Energy Projects for those interested in seeing Rankin Inlet various renewable projects.

Robert introduced our first speaker for Wednesday morning, Bruno Pereira, President and Chief Executive Officer, Qulliq Energy Corporation (QEC): **Nunavut’s Renewable Energy Transition: Opportunities and Challenges.**

In his opening statement, Bruno Pereira remarked that QEC aren’t necessarily big fans of diesel. “We have no love affair with diesel, the sooner we can get off diesel the better. We are stuck with diesel for now, but we are hoping to move away from diesel. QEC is open to open dialogue and your thoughts and looks forward to having great discussions and it is these conversations that make the conference worthwhile”.



QUESTION PERIOD FOLLOWING QEC'S PRESENTATIONS INCLUDED THE FOLLOWING Q&A:

1. Is there any discussion to start that transition?
 - a. We received some funding from the Federal government – to pursue renewable energy projects. There are 2 project streams from the transition from diesel to clean energy, QEC owned and Independent Power Producer (IPP) owned.
2. You mentioned the 25 communities are all subsidized; Grise Ford would be most expensive, is 26 cents flat across Nunavut or willing to look at each community costs.
 - a. The average fuel cost across Nunavut is about 31 cents. QEC will pay up to the avoided cost of diesel (currently around 26 cents) to IPPs for their electricity. The fuel cost is pretty flat across Nunavut, so QEC will only pay a flat electricity price for renewable electricity across Nunavut.
3. What about carbon tax, know it's not QEC area but where are the carbon tax funds going?
 - a. The GN is using a backstop program. QEC has been granted \$2M over 4 years to replace conventional streetlights with LED lights across the territory. QEC applied for this from GN. The GN is considering their options– electricity and aviation fuel are not included in the tax. Heating IS taxed!
4. From a review stand-point, when it comes to IPP, is there a process for community projects? Who would be evaluating this?
 - a. Any QEC projects over \$5M is considered a major project and has to be submitted to the Minister who makes final decision based on URRC (Utility Rate Review Council) recommendations. For IPP projects, the proponent will be required to adhere to QEC's Technical Interconnection Requirements to ensure the safety, reliability, and quality of power in our communities. In addition, IPPs will be required to sign a Power Purchase Agreement with QEC. This agreement will outline the conditions of the contract including price, length of contract...
 - b. With respect to rates and how we set the rates. QEC cannot change their rates on their own, every 4 years QEC has to go to URRC for a rate review – In 2018, QEC proposed equal territorial rates for all communities, but this was not approved by Cabinet. When QEC looks to change our rates, we submit a rate application to the Minister and URRC makes recommendations to the Minister on the QEC application. The current rates were approved in 2018 and locked in till 2021/22 – the only thing that changes are if cost of fuel goes up or down so we can continue to buy fuel. QEC cannot change rates on their own.

5. Will rates be lower in conjunction with IPP?

- a. We do not know; as we see more and more communities taking up renewable energy projects we will see less need to do maintenance. However, the savings is a long term thing. We developed an energy framework that looks at the cost of generating power: the cost of diesel plus building the infrastructure. Renewable energy projects require a long payback period, 20 – 25 years probably longer, to recover the cost without considering inflation. Our problem is financing renewable energy projects.

6. Will renewables need a separate meter?

- a. Yes, IPPs will need a separate meter to export the power. All the power that gets generated has to be sold to the grid; the customer buys it back at the applicable community rate. IPPs in Iqaluit will pay a much lower power rate (\$0.49/kWh) than an IPP in Whale Cove (\$1.12/kWh). This is one of the problems with having different rates in different communities. An IPP would need to look at all of this before committing funds to a project.

7. How can policy be structured so that there are incentives?

- a. This is not our only program. We are also looking at other options, cost structures, other programs, and are open to feedback. Have a pretty good idea of what we want to do; we don't believe we have all the answers. In terms of optimizing the grid, real concern of reliability of the system. Will have to look more of this as we go along.



The second speaker on Wednesday was Dr. Michael Ross, Industrial Research Chair in Northern Energy Innovation Yukon College, presenting: ***Considerations & Case Studies of Integrating Renewable Energies into Northern Canada.***

Martha Lenio, Specialist - Renewable Energy, Arctic, WWF-Canada gave her presentation: ***Renewable Energy Scoping Analysis for Nunavut.***

POST-PRESENTATION Q&A:

- a. Do all the airport weather stations take data? Does WWF take this into consideration?
- a. Yes, we look at all the data available, but wind data should be taken at the height and in the location of where you want the wind turbine. That is why it is so important to have community consultation, so everyone is in agreement with the location.



PANEL DISCUSSION: NORTHERN ENERGY OPPORTUNITIES

Moderator: Robert Connelly GN-EDT

- As a person running a small business, the challenge we have is the energy – most expensive bill we have to pay. The Inuit need to be part of any project and are needed to support the projects. Happy to have heard that in your [QEC] presentation, we need to be part of the solution. We hope you come to our community to do a consultation. The local population needs to know, we are looking forward to more dialogues. We are consumers, and we want to know how we can participate. Energy is running our homes day to day. Thank you Bruno for your presentation.
 - Bruno responded: yes, it is very important that we have good communication with all communities. Appreciate your comment about Inuit owned. We are available to do that, Jamie Flaherty's primary responsibility is to communicate with communities. This is the key.

2. Wondering if your team is going to go to Baker Lake and have a community consultation? Would it be possible to do a presentation? Thinking of home owners too, sometimes it's hard to keep up with power bills and they get cut off because they are unable to make payments. These are things we worry about. It's very hard to see someone or relative cut off from the power. Some don't have any options for how to pay off their power bills, or don't have generators or other equipment to keep their house warm. We would like to invite your team to come and talk to our community and to share information with our people. This is what I'm urging.

a. Bruno responded: QEC would like to come on their own; we will talk with the Climate Change Secretariat to do community energy planning and come and discuss what you have discussed, talk about power rates, and about renewable energy. We would be very happy to do that.

3. Listening to QEC's presentation I'm puzzled on communities that try to find ways to reduce diesel use, that they won't get that savings. What's the point if only going to subsidize diesel costs in other communities? Can you relook at this to

encourage renewable projects? What's the use to find better ways if local costs are being reduced, only just passing along to other communities that are using diesel?

a. Bruno responded: In terms of economic benefits, when communities enter into projects, there is a potential for a revenue stream there, as well as environmental benefits. In terms of rate structures, all out rates must be reviewed by the URRC. There is direction from our jurisdiction or regulatory body for the best setup for customers.

4. When you explain that it is 30 kilowatts, but willing to pay 26 cents for renewable, so we are subsidizing fuel companies but not subsidizing local companies when they use it?

a. Bruno responded: the 30 cents was a few years ago, now the average cost is around 26 cents, it fluctuates with cost of diesel.

5. Within this IPP are there opportunities for communities to get involved to build out that infrastructure for QEC?

a. Bruno responded: IPPs will be responsible for building their own infrastructure as well as operating and maintaining their systems.

6. This question is in regards to something that came up yesterday. In talking with Jackson, he is self-taught, via You Tube. Like many Inuit he is trying to learn on his own and is self-taught. How do we do a lot more of the training that is tied to this renewable training technologies? What are some of things that locals can do?
 - a. Dr. Ross responded: it is a tough challenge, everyone has a different base line - we are partnering with Arctic College, on research project, meeting with Matthew Ayres. No shortage of challenges, need the capacity to build the capacity. As far as integration, there is community energy planning, 20/20 Catalyst program and the ARENA program. Identifying people at the college level, get them to get in touch with Dr Ross. The more people we could train the better.
 - b. Dr. Lenio responded: WWF is bringing training programs into Iqaluit; one is a solar installation course, which would give us the capacity to do the net metering. The other training program is a home energy audit program. Having people in the community trained as energy auditors. With WWF, we do sponsor people to do the training courses, business development or other courses. This assists with energy literacy.
 - c. Dr. Ross responded: as part of many projects in the territory, communities are engaged via training which in turns then benefits the community. Example: NRStor looking to hire people from community to provide the O&M for the Arviat project. Want to move to a train the trainer model.
7. With respect to Coral Harbour, we are interested in getting more streetlights in our community. This past October, when we had our AGM, we had to stop, as the polar bears had come into town (in the dark area). We need to have more lights so if an animal comes into the area we will see them. The HTO did try to go to QEC, but nothing done yet, is there anything you can do for our community?
 - a. Bruno responded that he can follow up with the community and what the community needs and we would include you in the conversation. The hamlets pay for the streetlights, so would have to have that discussion with them to see if they would support that expense. We'd be happy to go through that process with you. We will determine together to see next steps. QEC is currently doing a review of each community, the LEDs are about 100 watts, immediately customers start receiving benefit. Believe these lights will last longer. Initial savings on energy and then on maintenance.
8. Question to QEC. Are you looking at geothermal?
 - a. Bruno responded: We did a desktop model by looking at 3 communities to see what is the potential of geothermal. The next step is doing test drills to see what the possibilities are; looking at all of the options and are considering life span, initial costs and all those factors. We are preparing a report to look at the different options. And identifying other options that may be available, but not ready. I.e.; tidal options in Iqaluit – looking at possibilities. This report is to be released in the spring.



Our first afternoon speaker on the Wednesday was Robert Connelly, Director, Kivalliq Community Operations, Government of Nunavut, Department of Economic Development & Transportation as well one of our conference committee members. Government of Nunavut: economic development programs to support businesses and communities.

POST-PRESENTATION Q & A:

- a. For contracts that GN proposes, a lot of time the solar aspect of contract is not always separate from the building construction – so then there is a need to have a joint venture; could the government break up the parts of the contract so the solar part could be separate?
- a. It’s very important for the government to breakout the contract. With respect to renewables, as QEC develops their policies, then GN will also have an opportunity to break out contracts.



The second afternoon speaker was Andreane Lussier, Climate Change Secretariat: Community Energy Planning.

Following the networking break, Eryn Stewart, Director, Indigenous Clean Energy Social Enterprise provided a presentation: Indigenous Clean Energy Capacity-building in the Kivalliq Region.

PANEL DISCUSSION: CATALYSTS

Moderator: Robert Connelly

Following Eryn’s presentation, Bill Williams and Blaine Chislett, both of who have taken part in the Catalyst program, joined the discussion panel.

1. Question to Blaine and Bill. What led you to this and how did you get involved in the Catalyst program?
 - a. Blaine responded: You don’t need post secondary education to take this course. Sometimes it’s hard to get off your feet. He wants his kids to have the option to live up here. He’s concerned that we will not have the wildlife in the future, so that is why he started to learn about this.

- b. **Nunavut has one of the youngest populations in Canada. Yet younger people have not seen that change in environment. How do you get them interested?**
 - a. Blaine responded: Listen to our elders, more people and younger people up north are getting stronger voices.
 - b. Bill: With young NDP MP Mumilaag – having her voice in Parliament – she ran on an environmental policy. We are hearing more from the youth, the youth are engaged in the territory.
 - c. Andreane: we also hear from youth, they write letters and are the reason why we decided to create the youth council. This past summer the Climate Change Secretariat participated to an event on the land for youth in the Kugluk park organized by GN-Parks and Special Places team. Elders were talking to kids about what changes they have observed due to climate change.
 - d. Robert: This is part of everyday life. As far as young emerging leaders: there are more and more Inuit teachers.
- c. **Question: I see a lot of potential for renewable energy and ways to learn more, I'd like to see more Blaine's – explain to community members what he learned about this program.**
 - a. Blaine: It's good to change their focus, refocus what they do at night; he sees a lot of bored teenagers – grab them now and get them to focus on renewable energy – the 20/20 program defined his focus on this; more youth involved in climate change – Blaine would be happy to talk about this to youth groups.
- d. **Question/Statement: I want to mention this is a great conference and a great venue to do things. How can we move forward? Where do you start? It takes a community to move this forward as the climate is constantly changing and getting warmer. We need to find ways to educate us and our children.**
 - a. Blaine: Agreement that this is a great way to start it all, would like to see more people involved in this conference. One thing that would help is to get a Baker Lake catalyst involved.



- b. Bill: Working for the Hamlet Kugluktuk, the support that we received from staff was huge - council support, HTO, SAO, working as a team. It was a team effort. Community members were involved – hamlet staff support this. Have community members share what they have learned from conferences and training. As long as you can show you are bringing back a return on investment you will continue getting support.
- c. Andreane: With respect to education (outreach and awareness), Climate Change Secretariat have modestly engaged but would like to help develop a educational tools that are customized for Nunavut and is culturally appropriate. Make information positive and leave room for creativity – we need community input and to frame it positively for them.
- d. Robert: Regarding next steps, today we have funders, research and development, effective stakeholders, finally in one room together. It's nice to see the Kivalliq leading the way. Tomorrow we will talk about where we go from here.
- e. **Question/Statement: I was born before there was electricity, happy we are looking for cleaner energy solution. Can see residue on the snow from diesel. Is there any work on making homes more energy efficient? Smaller communities are not thought of, they are left out. Even the smaller towns have all those old houses.**
 - a. Blaine responded: There are ways to make change; it's about retrofitting the houses we do have. Dismantling the house and spray foaming, and then we don't have to burn as much fuel. Using the thermostat controls. One of the simplest things we can do to stay healthy it fix up our homes.
 - b. Bill: Having discussions like this with all the stakeholders helps - all too often we only talk about QEC. If we had cleaner homes, we avoid higher costs for the health care system as people would be healthy and well.
- f. **Question: When you became a Catalyst, did you have a project in mind already? Did that change over the course of the program?**
 - a. Bill: yes, we did shift to an energy focus. You don't have to have an energy project in mind, you just need to have something that you want a solution for – efficiency is “low-hanging fruit”. Being part of the Indigenous Clean Energy network and seeing other community projects, is helpful. If you have an issue you are looking to solve, then this is good program.
 - b. Blaine: Rankin has always been windy, but that wasn't my focus when I went to the Catalyst program. My big focus was remediation of the dumps. Most are on the coasts, trash gets into the water. Now the focus has changed to a wind project, but still wants to look at the dump again in the future.

OVERVIEW DAY THREE

Thursday December 5th

The final morning focused on: Funding Programs for Renewable Energy Projects. Andreane Lussier from the- Climate Change Secretariat provided the first talk of the morning: Green energy funding opportunities with the GN.

POST-PRESENTATION Q & A.

1. **Question:** You mentioned Arctic Energy Alliance; there are 1000 homeowners in Nunavut, and we can't access funding without an energy audit. Are there plans in the future to help homeowners to reduce emissions?
 - a. Response: we can't fly auditors in, we don't have enough funds for this; there is a need for certified energy auditors in Nunavut. How do we get people trained? We are working with WWF and recognize this as a big priority.
2. **Question:** We did apply for funding to EDT and now with the ransomware attack, how do we apply for funding?
 - a. Robert responded: Iqaluit is up and running. The GN doesn't have historical materials. Resubmit your application. – Rankin is partially up and running. GN system is slowing coming back online. Updates are on website. Mentioned in discussion with Jackson, that doing the energy audits can be a business – this would support local businesses. Business funding is available through the GN. This could be an opportunity in all communities.
3. **Question/Statement:** I am a HAP owner, sad to say how much energy is coming out of my house, energy is coming out of my window. Not just Government units, but all houses, we witness a lot of heat loss – there is a lot of education needed for people not using their homes properly. An audit needs to be done. An awful lot of “red” tape, needs to be more “friendly” type, were you feel welcome to access fund.
 - a. Response: Will share that with Housing Corporation. Sometimes you can get the funds but cannot find a contractor.
 - b. Bill Williams: looking at other jurisdictions and home audits. This is a good business opportunity – good to add to their portfolios, if we have more small businesses with home energy audit services.



The second morning talk was by Jacquelyn Taylor, Funding Manager, Federation of Canadian Municipalities: Funding and Support through Federation of Canadian Municipalities.

POST-PRESENTATION Q & A:

1. **Question:** In terms of percentages, can your program be stacked with other funding programs?
 - a. **Response:** Yes, we can be stacked with anything.

2. **What is new to FCM?**
 - a. You can now get advances before the construction.
 - b. Municipal Asset Management Program: see slides for details. They are also open to hear your suggestions. There are quite a few resources online.
 - c. Sustainable Communities Conference – Oct 20-22, 2020 St John’s, NL.

3. **Does the applicant have to be the municipality or can it be the HTO or other organizations?**
 - a. Not completely crafted – so FCM could include that – the other organization would have to be connected with the Hamlet somehow.

4. **Does this apply to homeowners as well? As a private homeowner, how do we access?**
 - a. This could be priority for a neighbourhood. The application would have to be led by the Hamlet.

The last speaker of the conference was Barbara Gray, Environmental Policy Analyst, Northern REACHE Program, Climate Change and Clean Energy Directorate, from Crown-Indigenous Relations and Northern Affairs Canada. Federal Clean Energy Funding for Northern Communities.



COMMUNITY OPEN HOUSE

Following the Forum, participants welcomed the community to come and learn about renewable energy from our various committee organizations as well as from a few of our companies representing their projects. In all it was estimated that about 50 people came through the rooms to learn about renewable energy.



WRAP UP

Lessons Learned, Next Steps

Martha Lenio and Patrick Tagoona provided the emcee and facilitation of this final session.

Martha provided a quick summary of what we learned over the 2 and half days.

The organizing committees' goal was to educate, share information about renewable energy, and learn about green energy projects in Nunavut and the Arctic. The following final comments and statements were shared by participants and the organizing committee.

- Jamie Flaherty: We need community buy-in. Kivalliq QEC is going to make our face more known and will visit – contact us.
- Bill Williams: Need to look to linking renewable energy to economic development.
- Peter Tapatai: I am a resident of my community of Baker Lake. This has been extremely educational for me. Energy started with a Qulliq. Now we are in whole new environment that includes fossil fuels. We (Inuit) are not the cause of the depletion of the ozone layer but we are living with what southern Canada and Europe is giving us. But we are learning and want to be part of the solution. Not sure if 30,000 people can help lessen the problem. I want to be part of the solution. Open my mind, didn't know about solar panel, batteries, thermal, this is really educating for us; want to have this again, want it in Kivalliq again. School children should be part of the project – need to hold their hands to help move them forward. So our future needs to be protected and have another forum. I envy Arviat – part of growing our territory. This was a great conference and it should happen again. We are the customers and the land owners. We want to be part of the solution so our children will have a good life.
- Lucassie Nakoolak: I was a board member of KCC in 70s and 80s – Mayor of Coral Harbour. Lucassie is very thankful of the new knowledge – wants to see more about this and have the conference again.
- Patrick response: thank you Lucassie: When we are starting planning, for this to have an impact, it was important that we have community participation. Mayors, SAO and representatives from HTO/HTAs – it was important we have community engagement. It is good to hear it was a positive experience.
- Sophia Granchinho: I echo both Peter and Lucassie: I found it very interesting and learned a lot. Suggest at looking at another energy forum including discussion on the regulatory process – would be good to learn what the process may be and whether go through NIRB/NPC.
- Eryn Stewart: I go to a lot of different forums – this was one of the best I've ever been to, would like to see more of them in other places. Kudos to organizing team
- Hugh Haqpi: Agreed when coming, encouraging this type of this forum, lots of pertinent information and got a lot of good information. Wants to share that HTO can assist with the maintenance, the wind turbines. The HTOs can help maintain it – look to the HTO to assist with this project. Learned lots and encouraged more for the future

- Paul Okalik: I want to stress, I view this first opportunity. From here, let's move forward, learn from this, apply it and advance your communities. Energy is not going to stop if communities can advance and abuse it for your own benefit please.
- Klaus Dohring: Thank the organizers for having me. Great format, being a pioneer, saw the Inuvik energy forum start from oil and gas and changed the format and reached out to renewable energy companies; changed from taking energy from the ground to taking it from the sky.
- Patrick Tagoona: 50 – 60 years ago – we were living in iglus – used to heat with the Qulliq lighting, to where we are today. Hard to absorb, the intricacies and technology – we are the users, as Inuit we are very adaptive – we can adapt to the environment and we are open to technologies. Patrick Tagoona: This was our first event – we are happy with the response that we got, we can't have this without the funding, our thanks to our funders of this first Kivalliq Energy Forum. We appreciate the financial assistance from our funders.
- Martha Lenio: this whole process took a year to pull together. It was a little hard to convince people to come up for a conference – but everyone we reached out to was excited to come. Thank you to everyone that we called that were willing and happy to come up to Nunavut in December. And what it is like in the cold and harsh communities. We definitely hope to work on this again.
- Andreane Lussier: I've learned a lot too, thank you for coming.
- Robert Connelly: thanks to all the communities. In particular to our Kivalliq-region community members, this was really about you. We had fantastic speakers. They might have PhD and Master but do not have knowledge about our culture --- see lots of northern with expertise --- hearing overwhelmingly have other organizations involved - Sakku, KIA. We would like to include others – AEM and other project partners. Want to have them involved in the next Forum.

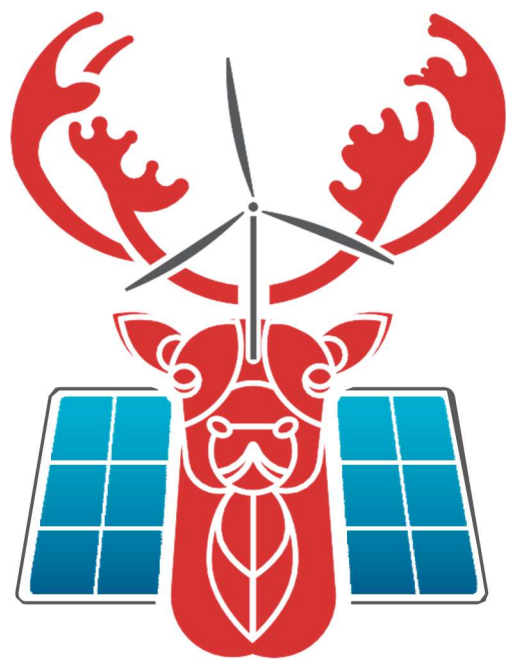


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KIVALLIQ ENERGY FORUM

DECEMBER 2 - 5, 2019

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