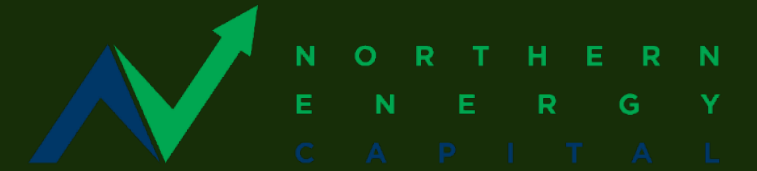


Alaska Wind Workshop

Sept 7-8, 2023

TECHNICAL HURDLES AND OPPORTUNITIES

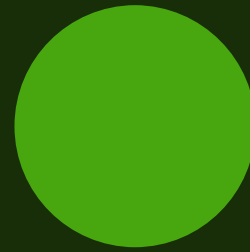
AGENDA



1. Introduction to Northern Energy Capital
2. Partnerships in Clean Energy Transformation
3. Overcoming Challenges in Construction and Logistics
4. Hurdles in Integration
5. Importance of Education

NORTHERN ENERGY CAPITAL

- Yukon company established in 2015 to empower communities in their transition from fossil fuel consumption to clean energy ownership.
- Specializing in the corporate structuring, project development, and financing of clean energy projects.
- Multiple Indigenous partnerships and joint-ventures that span eleven remote community micro-grids across northern Canada.



Delivering long term economic, social and environmental benefits while promoting engagement and community participation.



MISSION

Advance meaningful projects that:

- Increase community energy independence and resiliency
- Increase energy security and cost certainty
- Reduce carbon emissions
- Advance training and capacity building in the growing clean energy sector

Partnerships in Clean Energy Transformation

Kivalliq Alternative Energy

- Portfolio of community scale micro-grid clean energy projects

Eagle Hill Energy Limited Partnership

- Portfolio of utility scale regional grid-tied clean energy projects

Selkirk First Nation Development Corporation

- Portfolio of utility scale + mining clean energy projects

Kluane First Nation Clean Energy

- Remote community micro-grid clean energy project



Community Engagement

Community Energy Planning + Resource Assessment



Overcoming Hurdles

Construction and Logistics in remote micro-grids



Utilizing resources available to reduce those that are not.



Construction that can be done in cold climate and span over multiple years



Overcoming Hurdles

Construction and Logistics in remote micro-grids



Overcoming Hurdles

Construction and Logistics in remote micro-grids



Hurdles Integrating Renewables

Technical challenges in remote micro-grids

Environment (policy, economic, natural)

- Transitioning to an IPP model requires new policy to be developed
- Working within a regulated utility market, subsidized rates, without economy of scale
- Shifting funding legislation to support IPP
- Challenges with rime-icing; anti-icing, de-icing; and permitting nuances (black blades)

Availability of Data, Infrastructure and Capacity

- Gaps in infrastructure, operation and demand data; highly variable across the north
- Human resources across all stakeholders – utility, tribal council, government
- Projects and communities are generally unique, challenge to generate efficient process
- Often dealing with aging infrastructure, limiting possibilities or increasing capital costs

Variability of Renewables with Efficient Diesel Operation

- Inefficiencies with ramping and switching between diesel generators
- Variability of renewables, benefits of responsive ramp rates to maximize production
- Benefits of integrating full-suite of grid forming BESS services; absence of economics
- Developing “Technical Interconnection Requirements” – “Don’t know what don’t know”
- Turbine features, communications, CSA, evolving standards (UL1741 SB)



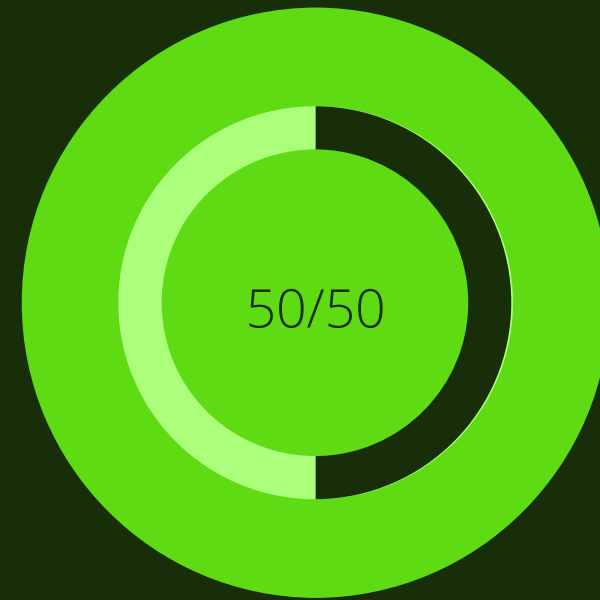


“ ”

***The strongest thing you can do towards
alternate energy is to educate.***

Blaine Chislett,

Local Energy Champion for the Indigenous Off-Diesel Initiative (IODI) Program
and Chief Sustainability Officer for Kivalliq Alternative Energy



WHAT MAKES NEC PARTNERSHIPS A WIN-WIN?

- Long term vision
- Move at the right pace
- Mutual understanding of cultural sensitivities
- Deliver on Training and Capacity Building Opportunities
- Mutual support for each others decision-making process



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THANK YOU