

Connecting the Arctic.

Renewable energy. Broadband Internet. The future of Nunavut.

Kivalliq Hydro-Fibre Link Project Summary





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Project Overview

The Kivalliq Hydro-Fibre Link (KHFL) is a nation building Inuit-led project that will be Nunavut's first infrastructure link to Southern Canada and will provide clean, renewable power and fibre-optic internet capacity for the Kivalliq region for generations to come.

Nukik, an Inuit owned corporation, is leading the KHFL on behalf of the Kivalliq Inuit Association (KIA) and its business arm Sakku Investments corporation.

The project is essential and transformative for the Kivalliq region, the territory and Canada. It will allow Kivalliq communities to shift away from diesel power by bringing baseload reliable and renewable power as well as fibre-optic internet.

- **The project alone will help meet Nunavut's 2030 GHG emissions reduction target¹. It is a once-in-a-generation opportunity to decarbonize communities and mines in Nunavut.**
- **It will bring high-speed fibre-optic broadband service to the Kivalliq region improving health, education, and service delivery for communities.**
- **It will advance reconciliation, create employment, business and equity opportunities for Inuit.**
- **It will sustainably unlock the mineral potential of the region and advance the electrification of this emission-intensive industry.**
- **Nunavut is Canada's largest territory and does not have electricity infrastructure connecting it to the rest of Canada. The KHFL will grid-connect Nunavut for the very first time, paving the way for two-way electricity trades in the future.**

- **It will be a nation-building, green infrastructure intertie project that will support federal and regional electrification objectives.**
- **The Project represents a unique business opportunity for Manitoba to secure a long-term Power Purchase Agreement with the territory utility**

The KHFL will be an approximately 1,200km high-voltage transmission line, connecting to over 370km of lower voltage 'feeder' lines leading to five communities in the Kivalliq Region of Nunavut. The project will be rated at 150 megawatts of electricity transmission capacity and will have fibre-optic bandwidth capacity of 1,200 gigabits per second (Gbps). The KHFL will offer download speeds that are approximately 3000% faster and upload speeds that are 1000% higher than the current speeds.

With support from the federal government, the Project is financially feasible, offering Canada a payback period of under 20 years through tax revenues. The Project can operate sustainably, with Inuit investment and leadership as a cornerstone of the long-term business case.

The project has the support of Inuit leadership within the region and territory, namely the Kivalliq Inuit Association, Nunavut Tunngavik Incorporated (NTI), and the Inuit Tapiriit Kanatami (ITK).

Work on this project is advancing rapidly and important partnerships have been formed with the Government of Canada, the Canada Infrastructure Bank, and industry-leading partners enabling to move this critical project into development.

¹ The project forecasts GHG reduction of 371,000 tonnes per year. Nunavut's 2030 target is 340,000 tonnes <https://unfccc.int/documents/461919>



Project Specifications

The backbone of the KHFL is a 1,200km 230kV high-voltage transmission line, connecting to over 370km of feeder lines that will deliver electricity and fibre-optic to communities. The Project will connect five communities of the Kivalliq region of Nunavut (Arviat, Whale Cove, Rankin Inlet, Baker Lake, and Chesterfield Inlet) to the Manitoba electric and fibre-optic grids. The Project will be rated at a minimum capacity of 150 megawatts (MW) and have a fibre-optic bandwidth capacity of at least 1,200 gigabits per second (Gbps).

The KHFL is leveraging industry-leading development partners to help develop the project from development to operations. The Development Partners include:

- **Valard Construction LP – Canada's largest transmission line, substation and telecom construction company;**
- **ATCO – Owns and operates Canadian regulated utilities and energy assets; and**
- **NextEra – One of the largest transmission developers and utilities in North America.**

The Project is considering a connection to the Manitoba Hydro grid near the Keewatinohk Converter Station northeast of Gillam, Manitoba. A 600 km transmission line will run northward from a 230 kV high voltage alternating current substation to a substation outside of Arviat Nunavut. From here the electricity will continue to be carried on a 230kV system 600km to its terminus in Baker Lake. A substation would be built outside of Rankin Inlet where power will be stepped down and run to Agnico Eagle's Meliadine mining site at 69kV, and the communities of Chesterfield Inlet, Rankin Inlet and Whale Cove at 34.5kV. The Baker Lake substation will likewise have a 69kV line running out to the Meadowbank mine.

Nukik and the Development Partners have started a constructability review in the remote region. This review considers variables such as mobilization and demobilization of crews, transportation logistics for equipment and the establishment of appropriate laydown areas. The team is also evaluating various types of transmission tower foundations which are most appropriate for the conditions. The base case calls for steel-latticed towers no more than 55 metres in height, with an average span of 400 metres between towers, and anchored with drilled and helix piles. The Project foresees that approximately 4,000 towers will be required.

Project Map





Progress to Date

The KHFL has been discussed by Inuit and northern Manitoba leaders for decades. In 2018, recognizing the strategic importance of clean energy and faster internet services, the Kivalliq Inuit Association restarted work to advance the KHFL. This work has been supported by funding from the Canadian Northern Economic Development Agency and Crown-Indigenous Relations and Northern Affairs Canada Northern REACHE program.

Under leadership of the KIA, the Project started early engagement with local communities and organizations and conducted baseline research in northern Manitoba and Nunavut. This work is assisting in developing an understanding of the socioeconomic, geomorphic, aquatic, heritage, and wildlife environments of the proposed development corridor and surrounding area.

This preliminary engagement and baseline information was a key input into a feasibility scoping study prepared in 2020. The feasibility scoping study evaluated technical routing options, electrical load, environmental and socioeconomic factors and determined that the KHFL was technically and economically feasible.

Based on the findings from the feasibility study and the community support during the preliminary engagement process, KIA and Sakku Investments incorporated Nukik Corporation to lead the development of the project. Nukik and KIA entered into an Advisory agreement with the Canada Infrastructure Bank and selected its Development Partners through a public process in 2021.

The federal government recognizes the nation-building nature of the project and the critical urgency to connect the Arctic with the rest of the country. As a result, the KHFL was mentioned in the 2021 federal budget which allowed for key activities to proceed. The Project is now into its Development Phase.



Good for the People



Inuit have lived in the Kivalliq region of Nunavut for generations. They have lived in harmony with the land since time immemorial, and yet now find themselves having one of the highest carbon footprints in the country.



Reconciliation

This project will advance economic reconciliation as a 100% Inuit-led project with equity investment and ownership



Nation Building

Connecting the region for the very first time, investing in energy security for the region and protecting our national sovereignty in the Arctic



Training

Invest in local capacity building to operate and maintain the asset, creating career and business opportunities for Nunavummiut



Good for the Environment



This project alone will meet Nunavut's 2030 GHG emissions reduction climate objective
GHG emissions reduction of 371,000 tonnes per year



Enable the electrification of emission-intensive industries such as mining
The Kivalliq region is home to some of the best untapped mineral resources in the country (including critical minerals)



Protecting the Arctic marine ecosystem
Reduction of heavy fuels shipments through arctic waters



A region ready and able to contribute to Canada's electrification efforts
Connecting the Arctic with a transmission line will unlock renewable generation in the North and enable two-way electricity trades in the future.



Good for the Economy

The KHFL will be the catalyst of generational socio-economic opportunities for the region



15,625 person-years of employment from construction



\$3.2 billion contribution to Canada's GDP during construction



Estimated **\$8 billion** revenues over 50 years



Training Inuit youth to work in the electricity sector



Sustainably unlocking the untapped mineral potential that exists in the region

Nukik Corporation

Nukik is an Inuit-owned corporation overseeing the development and operation of large infrastructure projects in the Kivalliq region of Nunavut. Its majority owner is the Kivalliq Inuit Association which is the elected body representing the interests of all Inuit in the Kivalliq region, acting as an advocacy group, a land holder, and administering provisions of the Nunavut Final Agreement.



Engagement and Partners

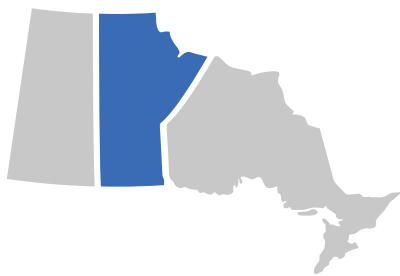
Under the leadership of Nukik and the Kivalliq Inuit Association, important relationships have been formed along the Project corridor with communities and Indigenous leadership. Priorities for early engagement have been to understand perspectives on potential Project impacts and mitigation options. Early, conditional support of the Project has been gained from Indigenous communities and is dependent upon continued engagement around environmental and socio-economic priorities. Relationships and partnerships are essential to the achievement of successful permitting and development work. Important and ongoing collaboration is also underway with Environmental Non-Governmental Organizations (ENGOS) providing key feedback on the Project configuration.

The early engagement work is assisting in developing an understanding of the socioeconomic, geomorphic, aquatic, heritage, and wildlife environments of the proposed development corridor and surrounding area. Scientific data collection and fieldwork programs have been completed for the last two years and are continuing. Data collection and fieldwork activities have been focused on characterizing the baseline environment along the proposed development corridor.

The following table lists communities and organizations that continue to be an ongoing engagement priority for the Project.

Data sharing agreements have been reached with all communities in the Kivalliq Region of Nunavut and northern Manitoba and studies and information is being shared with communities whose traditional territories overlap the proposed development corridor. Ongoing engagement with communities and land users continues to be a valuable insight for the project development process.

Future fieldwork research will support ongoing refinement of the Project’s proposed route and design, as well as help inform the environmental assessment process for the Project.



Manitoba

Government of Manitoba

Fox Lake Cree Nation

Ghotelnene K'odtineh Dene

Manitoba Métis Federation

Tataskweyak Cree Nation

Manitoba Hydro

City of Churchill

Town of Gillam



Nunavut

Government of Nunavut

Inuit Tapiritt Kanatami

Kivalliq Inuit Association

Agnico Eagle Mines Ltd

Qulliq Energy Corporation

Hamlet of Arviat

Hamlet of Baker Lake

Hamlet of Chesterfield Inlet

Hamlet of Rankin Inlet

Hamlet of Whale Cove

Hunter Traapper Organizations

KIA Lands Department



Canada

Government of Canada

Canada Infrastructure Bank

Department of

Northern Affairs

Beverly and Qamanirjuaq

Caribou Management Board

Seal River Watershed Initiative

Northern Projects

Management Office

Impact Assessment Agency

of Canada

Legend: Organizations highlighted in blue are project supporters

Environmental Permitting

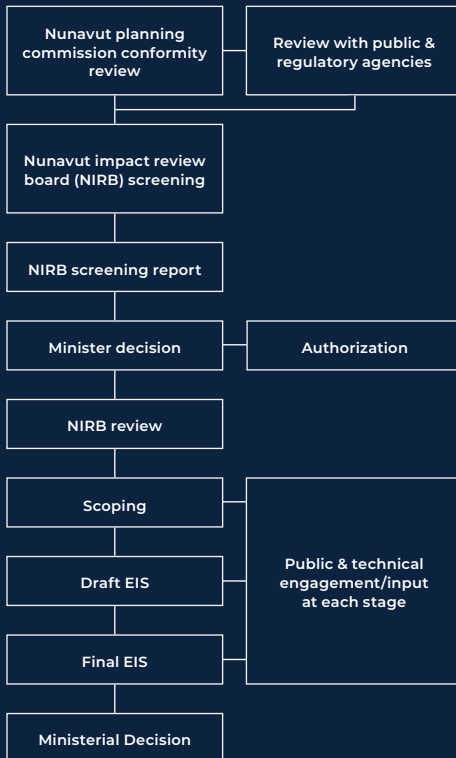
The Project will require an extensive review process and numerous territorial, provincial and federal environmental permits to proceed to construction. The exact number of permits required, and the duration of the process will be established once a draft Environmental Impact Statement (EIS) is submitted to the Nunavut Impact Review Board and Manitoba's Environmental Approvals Branch. Nukik has advanced desktop analysis and in-field baseline studies on diverse data sets and topics, most notably: caribou migration and polar bear denning; permafrost mapping; fish habitat; vegetation; species at risk; and heritage resources.

Desktop studies, combined with fieldwork and information gathered from Indigenous knowledge-keepers, will help in the formulation and submission of a draft Project Description in 2023, a final Environmental Impact Statement in 2024, as well as considerable fieldwork through the end of 2025. Nukik will bring considerable focus to bear on creating an efficient regulatory process that meets the standards and practices of all regulatory stakeholders, including Indigenous communities.



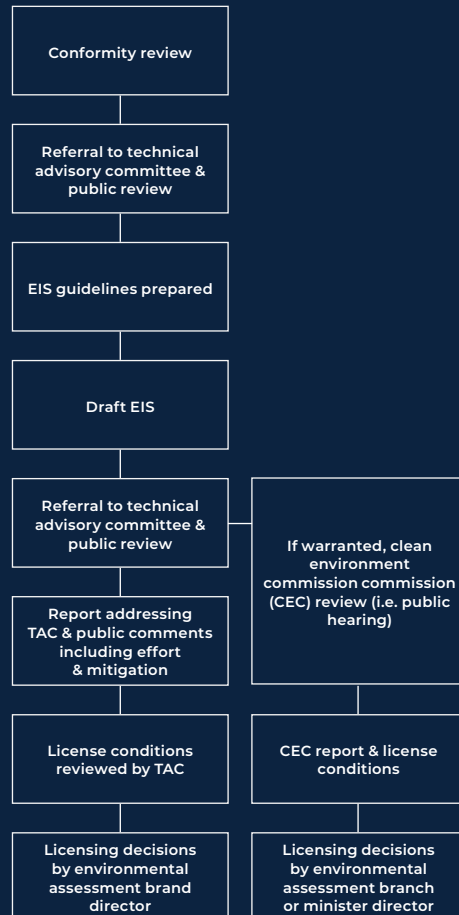
NUNAVUT

Project Scoping Document



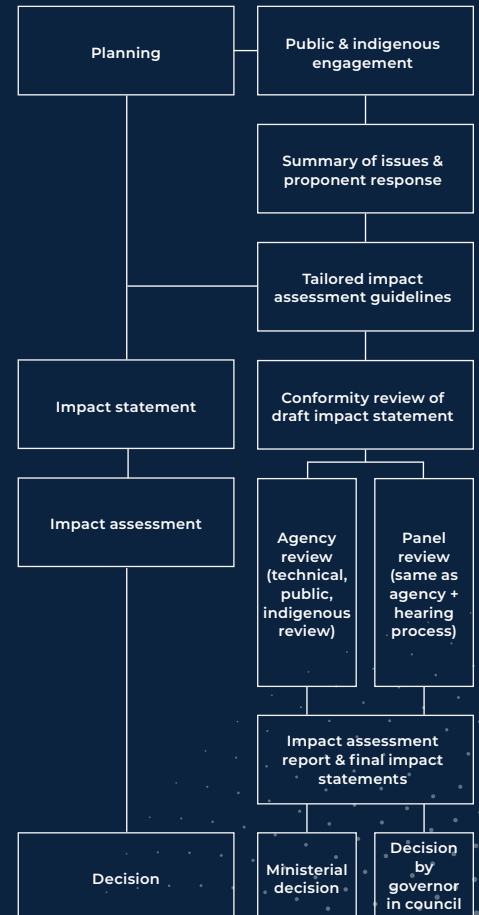
MANITOBA

Environmental Assessment Proposal Form



FEDERAL

Initial Project Description



Environmental assessment process requirements



Financial Overview

The KHFL will enable the delivery of clean, renewable power and high-speed internet to the Kivalliq region of Nunavut. The project has established prospective anchor costumers which include Qulliq Energy Corporation (QEC) - the Crown power utility for Nunavut - and one of Canada's largest gold mine producers: Agnico Eagle Mines' (AEM) with two active mines in Nunavut at its Meadowbank and Meliadine facilities.

The revenues of the Project are estimated based on the sale of electricity to QEC and AEM mining operations, and the sale of fibre-optic capacity to an established internet service provider (ISP). The model assumes the electricity price to QEC and AEM would be determined by their avoided electricity costs so customers would not experience higher costs than they would otherwise have been paying. The Project is basing revenue on a conservative 82 MW of demand in 2040, with at least one operating mine. This ensures the Project has sufficient capacity to allow for growth in the region.

The project expects to secure financing from private equity and from the Canada Infrastructure Bank (CIB). Despite potential private equity and CIB investments, there is a funding gap which the proponent is seeking project support from the Federal government.

The Project will generate sufficient tax revenue (corporate, personal and direct) from construction, operation and mining operations to recover the value of the grant within 10 years of the Project going into service.







Preliminary Schedule

Nukik is following a staged process to develop the project. This will provide greater risk management and visibility into the project. The proposed stages and timelines are explained below. The Pre-Development Phase was completed at the end of 2021.

2018 to 2021

Pre-Development

- Project scoping
- Early feasibility
- Early engagement
- Government partnerships
- Selection of development partners

2022 & 2023

Development

- Engagement activities
- Advance engineering and routing
- Advance commercial aspects of project
- Plan for permitting and consultation
- Financial modeling



2023 to 2026

Engineering & Procurement

- Consultation
- Environmental permitting
- Engineering design
- Commercial negotiations
- Early procurement

2026 to 2030

Construction

- Safety, environment and quality management
- Accommodation and logistics
- Final procurement
- Construction of the transmission line, substations and fibre optic
- Commissioning and energization
- Reclamation



Summary and Next Steps

The KHFL is a once-in-a-generation nation-building green infrastructure project that can help decarbonize communities and mines in Nunavut, provide high-speed internet to communities and position the Kivalliq region for sustainable growth and two-way electricity trades in the future.

Work completed to date has confirmed that the project is technically and financially feasible. With the support of the Canada Infrastructure Bank and the Development Partners, Nukik is advancing the KHFL by launching its Development Phase in 2022 with the objective of energizing the line in 2030.

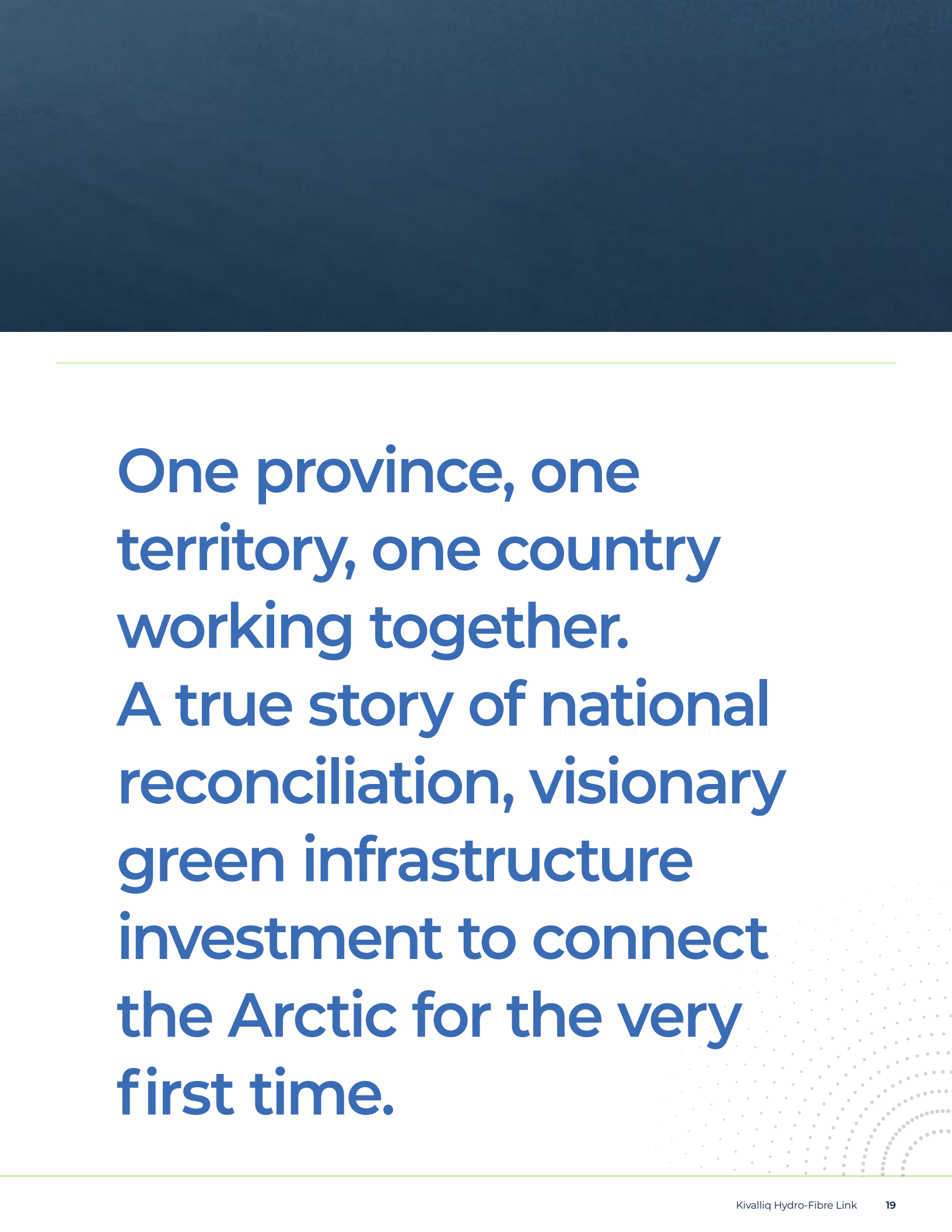
The next phase of work will involve:

- **Further engagement with Inuit and Indigenous communities and gathering traditional knowledge including Inuit Qaumjimajatuqangit;**
- **Performing baseline studies to confirm assumptions and support technical and socio-economic work;**
- **Advancing the engineering and routing work;**
- **Engaging with Manitoba Hydro and Qulliq Energy Corporation on the technical and operational requirements for connecting the Manitoba grid to the Kivalliq grid;**

- **Formal permitting and consultation plan including discussion with regulators;**
- **Commercial agreements with key partners.**
- **Working with the federal government to map out development approach and the necessary level of support the project needs to confidently advance.**

In order for this nation-building initiative to proceed, the project will need definitive support from the federal government, collaboration with the Government of Nunavut and successful negotiation with Manitoba Hydro.

Nukik acknowledges the support of the Canada Infrastructure Bank, Canadian Northern Economic Development Agency and Northern REACHE program in supporting the work accomplished to date.



One province, one
territory, one country
working together.
A true story of national
reconciliation, visionary
green infrastructure
investment to connect
the Arctic for the very
first time.



nukik.ca

