

Energy

Microgrids in Remote First Nation Communities

MT:CC Dec. 7, 2017	Cabinet Dec. 13, 2017	TB/MBC 2018-19 PRRT
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This government's commitment

“Where community support exists, Ontario would work with First Nation organizations to develop advanced microgrid solutions in First Nation communities. These projects would support economic growth by reducing reliance on diesel fuel and enabling stable, predictable sources of power. Projects would focus on renewable energy such as biomass, solar, and waterpower”.

– Ontario's Climate Change Action Plan – Released June 8, 2016.

SUMMARY OF PROPOSAL

The Ministry of Energy (ENERGY), working with the Ministry of the Environment and Climate Change (MOECC) and the Ministry of Indigenous Relations and Reconciliation (MIRR), is seeking approval to design and deliver a program that will seek to reduce diesel use in the four remote First Nation communities not currently economically feasible to connect to the provincial electricity grid, and where there is the highest potential for diesel and greenhouse gas emission (GHG) reductions. The ministry would engage with the four First Nations and appropriate Indigenous organizations in the development and delivery of the program.

The Climate Change Action Plan commits to supporting the development of initiatives to reduce diesel use through microgrids and other renewable technologies in remote First Nations. The cost of producing electricity using diesel fuel can be volatile, and is expected to continue to rise over time. Finding renewable alternatives provides an opportunity to mitigate some of those cost uncertainties, and help meet the province's GHG reduction targets.

What is the regulatory impact of this proposal?

There is no regulatory impact of the proposal.

What is the expected cost to government?

The program proposal is projected to cost \$50 million over 3 years starting in 18/19, with the ministry proposing that program costs be offset from the Greenhouse Gas Reduction Account (GGRA). Approval of offset from the GGRA is subject to evaluation by the Minister of Environment and Climate Change, the availability of funds, and Treasury Board/Management Board of Cabinet (TB/MBC) program and funding approval.

Note that there is an opportunity to further leverage some of the program cost from the federal government, through program funding or by allowing flexibility in the way that First Nations claim expenses related to electricity (i.e. redirect their operating funds to support a project). The ministry will continue to engage the federal government to explore opportunities.

FINANCIAL SUMMARY				
\$ Millions	2017-18	2018-19	2019-20	2020-21
Initiative cost requested	0.0	10.0	20.0	20.0
Requested program base	0.0	0.0	0.0	0.0
Proposed offset (GGRA)	0.0	10.0	20.0	20.0
Total fiscal impact	0.0	0.0	0.0	0.0

How will the changes be communicated?

A low profile approach is recommended with specific projects being announced as they are funded rather than announcing a new program which will have limited eligibility and targeted uptake. An allocation of funding for microgrids could be announced in the context of other CCAP commitments, particularly those directed towards Indigenous communities.

NOTES FROM COMMITTEE (MT:CC December 7, 2017)

Committee members were supportive of the proposal and recommended it proceed to Cabinet without changes.

Members discussed the challenges of operating in remote settings and the technical challenges and limitations of some renewable intermittent energy supply options in this context. It was also noted that there may be interest in microgrids more broadly for end of line grid connected First Nation communities.

Members were interested to understand if emerging technologies (e.g. hydrogen storage) could be used in remote settings to enable deeper diesel reductions. The ministry indicated that there was certainly an opportunity to explore these options, but noted that it was important to work with communities on the development of solutions that the communities themselves are comfortable with.

Members also indicated support for continued engagement with the federal government to leverage federal funding to support this initiative.

CABINET OFFICE ANALYSIS

Introduction

Twenty-five remote First Nation communities in Northwestern Ontario currently rely on local diesel generation systems for electricity. These remote First Nations face a number of social and economic challenges which impacts their capacity to participate in programs offered by the provincial and federal governments. Many First Nations experience load restrictions due to the limited capacity of their diesel generation systems, and diesel fuel has a number of other drawbacks, including environmental risks associated with transporting it, high transportation costs, and high emissions.

The ministry reports that given the rising cost of diesel and the shortening winter road season, local diesel generation systems are becoming more expensive to operate. Conversely, the cost of renewable generation and storage is decreasing, with new technologies being tested and demonstrated in harsh climates and remote locations.

Through the Climate Change Action Plan (CCAP), the ministry was directed to work with the Ministry of Environment and Climate Change (MOECC), and the Ministry of Indigenous Relations and Reconciliation (MIRR) on an implementation plan to work with First Nation governments and organizations to develop a program for low-or-no-carbon-energy-powered micro grids and other alternative energy projects (e.g. solar or wind powered advanced microgrids).

The Independent Electricity System Operator's (IESO) 2014 Remote Community Connection Plan report identified that, for 21 of the 25 diesel powered remote First Nations, grid connection is the most economical option for reducing diesel dependence and moving to a clean and resilient supply of power to meet community needs.

Electricity service in Ontario's remote First Nation communities is a shared responsibility between Ontario and the federal government, as defined in historic agreements. A First Nation-led proponent, Wataynikaneyap Power, is developing the project to connect 16 of the 21 remote communities that are economical to connect to the provincial grid in partnership with FortisOntario. The ministry is working closely with the proponent and partner ministries to support the proposal, and is in active negotiations with the federal government regarding project funding. The five other First Nations identified as economic to connect to the provincial grid are Matawa First Nations and are not currently part of the Watay proposal. The ministry is continuing to reach out to the remote Matawa communities to develop a plan for connecting to the grid in a way that meets community needs and is consistent with regional development and infrastructure planning for the Ring of Fire.

For four of the 25 First Nation communities, connection to the provincial grid is not currently economical, and it is here that the ministry has assessed there to be the highest value for money opportunity to reduce diesel use with microgrid and renewable

technology, over the long-term. Three of the four communities are in the process of developing renewable energy solutions to mitigate some diesel use and enhance capacity and reliability, however, opportunity exists to build incrementally upon the projects already underway, and to work with the fourth community to develop projects that maximize diesel offsets and meet community needs.

Proposal

The ministry is proposing to engage directly with the four remote First Nations (Fort Severn, Gull Bay, Weenusk, and Whitesand First Nations) and First Nation organizations, as appropriate, to develop a program that to support projects in those communities given their unique circumstances. Projects under the proposed program would need to identify GHG emissions reductions and could include:

- Clean, renewable generation with advanced microgrid technologies to offset diesel use in the near and long term; and
- Scalable technologies (e.g. energy storage) that can be implemented and/or built upon to work incrementally towards renewable energy as the main source of power.

The ministry estimates that GHG emissions reductions from microgrid projects supported through the proposed program would be approximately 146,343 tonnes of CO₂e over the estimated 20 year useful life of assets, which is equivalent to permanently removing 3,526 cars from the road.

The ministry advises that a community driven approach to program development is fundamental for success to provide, for example, opportunities for training and employment and Indigenous procurement opportunities. A community-drive approach also facilitates the incorporation of traditional values and Traditional Ecological Knowledge in energy solutions. The proposed program would support projects that integrate storage and renewable generation such as wind, solar, biomass, or hydro, into existing distribution systems. While detailed program parameters are not yet developed, the ministry indicates that eligible costs would be actual costs directly attributable to and necessary for the successful completion of the project, and details of the eligible costs would be outlined in the program guidelines to be developed (See Appendix C- Possible Eligible Expenses).

Diesel reduction is a shared priority between Ontario and the federal government, and costs for electricity service in remote First Nation communities is a shared responsibility between Ontario and the federal government. Natural Resources Canada (NRCan) recently announced programming to support Clean Energy Infrastructure, including diesel reduction, following an announcement of \$220M in funding through the 2017 federal budget. The ministry participated in engagement sessions as the programming was being developed, and will continue to work with the federal government to align programming and identify opportunities for federal funding supports. The ministry will also continue to work with MIRR, MNRF, and Ministry of Northern Development and Mines (MNDM) during program development and implementation.

Linkages

Whitesand First Nation Combined Heat and Power Project – The Ministry of Natural Resources and Forestry (MNRF), working with the ministry, will be proceeding to TB/MBC prior to the TB/MBC approvals for this proposal for funding to support the development of a 5 MW Combined Heat and Power biomass plant and wood pellet facility through the GGRA, to align with possible announcement of federal funding support from the federal Low Carbon Economy Leadership Fund and to allow for construction to begin in the 2018 season. As mentioned above, this proposal would complement the advanced work with Whitesand First Nation and build off of its successes to date.

Ontario's Fair Hydro Plan – On June 1, 2017, the *Ontario Fair Hydro Plan Act, 2017* became law, reducing electricity bills for residential consumers and as many as half a million small businesses and farms across the province. The OFHP also helps electricity consumers by enhancing a number of electricity support programs, including the First Nation on Reserve Delivery Credit (FNDC), and Rural and Remote Rate Protection (RRRP). Many remote diesel reliant First Nation communities' electricity is provided for by Independent Power Authorities (IPAs) that are not regulated by the Ontario Energy Board, and are therefore not eligible for the assistance under the FNDC or RRRP programs. The proposed program will help offset diesel consumption and reduce costs for communities in the longer term.

Remote Electrification: A First Nation-led proponent, Wataynikaneyap Power, is developing the project to connect 16 of the 21 remote communities that are economic to connect to the provincial grid. On August 27, 2015, Wataynikaneyap Power signed a partnership agreement with FortisOntario, an industry partner with transmission development experience.

REINDEER Program – Hydro One Remote Co's **Renewable Energy INnovation DiEsel Emission Reduction (REINDEER)** program was developed to support projects that connect renewable energy generation to reduce the impact of diesel fuel on the environment within their service territory. This is the remote version of FIT/MICROFIT/Net Metering, with modified guidelines, as the programs in place in grid connected communities are not appropriate in a remote context.

Climate Change Action Plan – Released in summer 2016, the CCAP reiterated the 2016 Budget commitment to greenhouse gas (GHG) emissions reductions and stated that Ontario intends to invest in initiatives that both reduce GHG emissions and ensure that the net impact of cap and trade would not result in an overall increase in electricity costs for commercial and industrial consumers. As mentioned, CCAP included ambitious commitments to eliminate remote First Nation reliance on diesel through microgrids and other means by 2020 (see page 6- Risks and Considerations). The CCAP includes a commitment of between \$85 and \$96M that targets collaboration with Indigenous communities including microgrids. It is proposed that funding for this initiative would not be counted towards this existing bucket given its unique targeted nature.

Truth and Reconciliation Commission of Canada – In June 2015, the Truth and Reconciliation Commission released an Executive Summary of the findings in its multi-

volume Final Report, including 94 “calls to action” for federal, provincial, territorial and Indigenous governments to further reconciliation between Canadians and Indigenous peoples. Ontario is working with Indigenous partners to address the legacy of residential schools, close gaps and remove barriers, create a culturally relevant and responsive justice system, support Indigenous culture, and reconcile relationships with Indigenous peoples. Ontario is investing more than \$250 million over the next three years on programs and actions focused on reconciliation.

Aboriginal Community Energy Plan (ACEP) Program – The ACEP program, delivered by the IESO supports Indigenous communities in the development of comprehensive, long-term energy plans. More than ninety-five communities have participated in the program so far. The ministry intends to build off these plans where possible and implement community driven approaches. Implementation of community energy plans was a key take away from the Long-Term Energy Plan (LTEP) engagement sessions with communities, and will be featured as part of the ministry’s forthcoming 2017 LTEP. Of the four communities eligible for microgrid funding, only Whitesand First Nation has accessed the ACEP program at this time.

Aboriginal Loan Guarantee Program (ALGP) – The \$650 million ALGP supports Indigenous participation in renewable green energy infrastructure in Ontario including transmission, wind, solar and hydroelectric generation projects. The program provides a Provincial guarantee for a loan to an Indigenous corporation to purchase up to 75% of an Indigenous corporation's equity in an eligible project, to a maximum of \$50 million. The program is available to corporations that are wholly-owned by Indigenous communities and is administered by the Ontario Financing Authority (OFA). The government has approved nine ALGP loan guarantees to date. As smaller applications may not be cost-efficient and program requirements, including financial due diligence, are stringent, the ALGP is better suited for applications greater than \$5 million and assessed to be financially able to support loan servicing and repayment. Consequently, the ALGP may only be suitable for financially viable microgrid projects that require significant funding and after taking into account GGRA contributions.

Aboriginal Procurement Program – The program encourages ministries to purchase from Aboriginal-owned businesses when goods and services benefit Indigenous people or communities, serve the needs of Indigenous people (e.g., a government program or policy for Indigenous people) or are culturally specific to Indigenous people. Ministries can apply Aboriginal procurement preferences, including set-asides and Indigenous participation requirements to target procurement opportunities to Aboriginal businesses.

Enhancing Indigenous Voices and Control – EIVC is a whole-of-government policy framework provides a set of models for ministries to use in their program and policy development to support Indigenous participation in decision-making and advance the shared goal of improving outcomes and opportunities for Indigenous people. The Program / System Design model of the Framework establishes or supports Indigenous-governed structures that can design service systems or individual programs tailored to meet the needs of the community or groups they serve.

Delivery

The ministry proposes to work closely with First Nation communities and organizations to develop and deliver this program, and is developing a targeted engagement strategy for implementation in the winter of 2017/18. In addition, involvement of the Local Distribution Company (LDC) (e.g. Hydro One Remotes, or Independent Power Authorities) in the program development and implementation is critical to ensure that any projects could be integrated into the existing distribution system and for reliability and safety to be maintained.

The delivery model will be refined through consultation with stakeholders, First Nations and representative organizations, given that there are a number of ways that responsibilities can be assigned allowing the ministry to either take a stronger role in program delivery or to delegate administrative aspects of program delivery to a third party. There may be an opportunity for a co-delivery model or for the ministry to delegate certain aspects of program delivery to Indigenous organizations to increase Indigenous control and ownership over funded projects.

Project proponents would be either First Nations or Indigenous organizations, ensuring that projects are being driven by community needs but also allowing the flexibility required to seek outside support to enhance project development and implementation capacity.

Stakeholder and Partner response

First Nations – Mixed – The ministry reports that First Nations have indicated significant interest in microgrids and renewable energy projects. While it is generally anticipated that supports for microgrids will be well received, the targeted nature of the program is likely to receive a negative reaction from First Nations that are ineligible to participate. The ministry has engaged with the four targeted First Nations and anticipates that they will be highly supportive of the program. This initiative will need to be communicated in the context of other programs to reduce diesel dependence and provide lower-cost power supply, in particular the remote grid connection initiative currently underway.

Indigenous Organizations – Neutral – It is expected that there will be general support for the program but that the Chiefs of Ontario and Political Territorial Organizations may be concerned with limited scope of eligibility. The ministry will develop a proactive communications plan to respond to concerns about program scope by emphasizing the other program supports available, including funding for the implementation of community energy plans (once announced).

eNGOs – Positive – It is anticipated that initiatives reducing GHG sources, including reducing diesel and increasing use of renewables to support the electricity needs of remote communities will be supported by environmental groups.

Local Distribution Companies (LDCs) – Neutral to Positive – LDCs are expected to support efforts to improve the efficiency of remote electricity systems, however, their support for this initiative is expected to be contingent on being active partners in developing projects

where they will be expected to play a role in operation of the system and where integration with their existing diesel generation systems may have implications for system safety,

Federal Government – positive – The Federal Government is expected to be very supportive of this initiative, as it will provide a potential source of matching funds for projects supported under NRCan's newly announced Clean Energy Infrastructure Programming, it also responds directly to the mutual priority of reducing diesel use in remote communities.

Risks and Considerations

Remote Conditions and Capacity

Renewable energy projects in remote communities face a number of challenges, both in terms of project execution as well as ongoing operations and maintenance after the project concludes. Many First Nations face capacity constraints in their ability to plan and implement projects, as well as to maintain high-tech systems in the community for the life of the assets. If systems are not maintained or operated in accordance with manufacturers' recommendations, there is a significant risk that projects will not have the intended impact to overall diesel usage. Even with experienced operators, maintenance is more challenging due to the scarcity of parts and skilled labour in remote communities.

In the four First Nations, energy is delivered through either Hydro One Remotes Communities Inc. (HORCI) (Fort Severn, Gull Bay and Whitesand), which is regulated by the OEB, or by IPAs (Weenusk), which are not OEB regulated and are the responsibility of the First Nation and federal government. Involvement of HORCI and IPAs in the project is critical to ensure that the project can be integrated into the existing distribution system and for reliability and safety to be maintained.

The ministry also proposes to further mitigate this risk through a community engagement centred approach. The ministry anticipates that if the community owns the asset and is trained and engaged directly in its operation, there is a greater likelihood that the system will maximize the potential for diesel savings.

CCAP Objective- 100% Diesel Reduction by 2020

The province is unlikely to meet its internal CCAP objective of 100% diesel reduction in remote First Nations by 2020. This is due to many factors including the long project lead times for grid connection, development time for microgrid projects, the need to align with short transportation and construction windows in northern communities, realities of operating energy systems in remote and harsh environments, limitations of renewable and storage technologies and the need for certain levels of reliability and energy load. The proposal will assist in the deployment of projects for significant diesel reduction, but will likely not ultimately eliminate the need for diesel generators in unconnected communities, until technologies mature. The ministry is confident that the proposed path forward meets the spirit of the direction, and will provide an excellent opportunity for communities to minimize diesel use, reduce GHGs, and result in projects that are responsive to community

needs.

Federal Government Involvement

Costs for electricity service in remote First Nation communities are a shared responsibility between Ontario and the federal government. In practice, the Province generally subsidizes operating costs in communities served by a regulated distributor (RemoteCo) through the RRRP program, whereas communities served by Independent Power Authorities receive only Federal operating funding. The Federal government has made action on Indigenous issues a priority including reducing diesel use in remote communities. As indicated, there is an opportunity to seek support from the federal government, through program funding or by allowing flexibility in the way that First Nations claim expenses related to electricity (i.e., redirect their operating funds to support a project).

The ministry, working with the Ministry of Intergovernmental Affairs (MIA), will continue to engage the federal government to negotiate a path forward that recognizes that in addition to community benefits, these projects have the potential for mutual gain for both Ontario and Canada. However, it is not proposed that provincial support for projects in the 4 communities through this program would be contingent on a federal contribution.

It is also possible that projects could impact the way that rates are applied in HORCI serviced communities, and have the un-intended consequence of shifting operating costs from the Federal government to Ontario ratepayers or taxpayers. This can be mitigated by working closely with HORCI and ensuring that they are active partners in projects proposed to interact with their systems.

First Nation Involvement

A community-led approach is key to the success of the project. This approach will contribute to community confidence that the technologies introduced in the communities will meet their energy needs in a sustainable, culturally appropriate way. Active participation of the communities in the projects will contribute to the success of each project, including through training, employment and procurement opportunities and the incorporation of Traditional values and Traditional Ecological Knowledge with respect to the energy solution implemented. Success will also depend on the development of long-term plans for the ongoing operation and maintenance of the technologies once the proposed five-year projects are completed.

The ministry advises that ensuring the long-term sustainability of the systems will be a critical part of the development of the projects. Energy will work with the communities in this regard. Arrangements with the communities will likely vary, depending on the project supported, how new assets integrate within existing systems and what are each community's interests in terms of ownership and operational responsibility.

Availability of Cap and Trade Proceeds

Program funding and implementation will be scaled to the availability of cap and trade proceeds from emissions allowance auctions. Results of auctions are subject to volatility

as a result of the carbon price, market conditions, currency exchange rates, among other factors.

Terms you need to know:

- **Microgrid:** A microgrid is a power grid that can operate independently or in conjunction with the area's main electrical grid. Remote communities are already very basic, isolated microgrids using diesel as their fuel source. Within an “advanced microgrid”, you will find distributed generation sources, load (such as critical infrastructure, households, industrial customers, or businesses), and a smart control system, which combined form a whole system that is greater than its parts. An advanced microgrid may also include energy storage.
- **Traditional Ecological Knowledge:** also called by other names including Indigenous Knowledge, refers to the evolving knowledge acquired by Indigenous peoples over hundreds or thousands of years through direct contact with the environment.

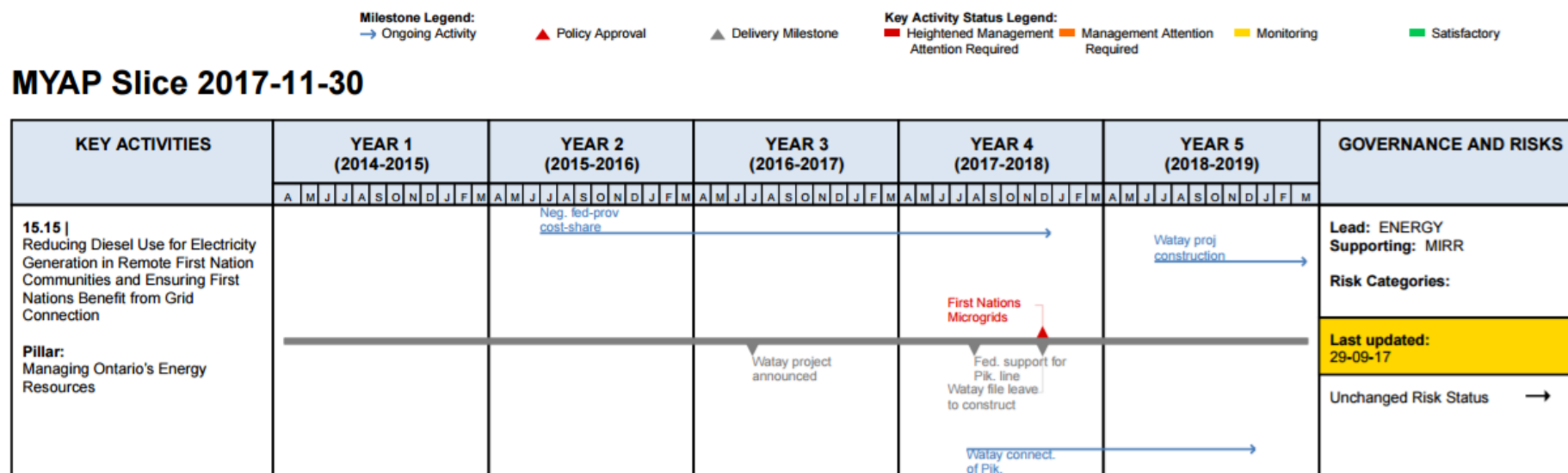
PROPOSED CABINET MINUTE

CABINET AGREED THAT:

1. The Ministry of Energy (ENERGY), working with the Ministry of Indigenous Relations and Reconciliation (MIRR), the Ministry of Northern Development and Mines, and the Ministry of Natural Resources and Forestry, as appropriate:
 - A. Develop a program to reduce diesel use in the four remote First Nation communities where connection to the provincial grid is not economically viable; and
 - B. Engage with those First Nations and appropriate First Nation organizations to inform program design and long-term sustainability.
2. ENERGY work with Ministry of Intergovernmental Affairs (MIA), the Ministry of Environment and Climate Change (MOECC) and MIRR to engage the federal government regarding federal funding for First Nation diesel reduction projects.
3. ENERGY work with MOECC to ensure completion of the Minister of the Environment and Climate Change's evaluation of the initiative prior to reporting to Treasury Board/Management Board of Cabinet (TB/MBC) with program design and multi-year funding requirements.
4. ENERGY work with the Premier's Office and Cabinet Office on an integrated communications strategy.

APPENDIX A: Multi-Year Action Plan (15.15 Ensuring Communities Benefit from Grid Connection or a Reduction in their Dependence on Diesel)

Below is an extract taken from the MYAP which demonstrates the overall strategic plan for the initiative that this policy submission supports. This excerpt represents the approved plan to date, and may not reflect the specific policy and delivery timelines identified in the Cabinet Minute above.



APPENDIX B: Remote First Nations in Northwestern Ontario



Appendix C: Possible Eligible Expenses

While program parameters are not yet developed, the ministry indicates that eligible program expenses could include:

- Project development costs (e.g. environmental studies, engineering services, technical studies);
- Materials, and costs related to transportation of materials;
- Labour costs, including project management costs;
- Training costs to support operations and maintenance;
- Maintenance costs;
- Infrastructure directly related to the project;
- Capacity funding and support for community engagement in planning the program; and
- Monitoring and evaluation costs.