

Ikayuut Solar and Energy Storage Project FAQs

General Project Questions

How big is the renewable energy project?

The Ikayuut Project in Naujaat is a utility-scale solar energy project. It has a **1.4 MW** solar array and a **1 MWh** battery energy storage system. It will generate enough clean electricity to displace up to **30%** of the community's annual electricity. That's enough clean electricity to power the equivalent of **133 homes per year** and displace approximately **400,000 litres** of imported diesel fuel.

Who will build the project?

The project will be delivered by **Kivalliq Alternative Energy (KAE)**, an Inuit-led organization consisting of a partnership between Sakku Investments Corporation and Northern Energy Capital. A project of this size requires many engineers, material suppliers, and trade contractors from all disciplines to come together. KAE has hired Solvest Inc., as well as several northern Canadian-based subcontractors, to complete aspects of the design and construction of the project.

How long will the project take to build?

The Ikayuut solar project is expected to take **2-3 years** to develop, design, and build. At this stage, the project development and design phases are nearing completion, and project construction is scheduled to begin in Naujaat in September 2024. Commercial operation of the Ikayuut Project is scheduled for Spring 2026.

Economic and Cost-Related Questions

How much does it cost to build a solar project in northern Canada?

The cost of solar energy projects depends on many factors, including their size and location. A 1MW solar project in northern Canada today would cost approximately **\$15-20 million**. The cost to build a solar project is higher in remote, northern communities than in other parts of Canada for several reasons: lower availability of specialized equipment that must be brought in, higher cost and complexity of logistics and shipping to remote areas, and materials and equipment that must be specially built to withstand the harsh Arctic climate.

Who would own, operate, and maintain the clean energy project?

With financial assistance from Canada, the Project will be built, owned, and maintained by Kivalliq Alternative Energy (KAE). Under Qulliq Energy Corporation's (QEC) Independent Power Producer policy, KAE is a non-utility, Inuit entity that will produce and sell electricity to QEC. KAE is a partnership between Sakku Investments Corporation and Northern Energy Capital. By selling electricity to QEC, KAE will maintain the facility, hire operators and maintenance personnel, and expand the renewable energy capacity and skilled labour force for the region's clean energy future.

Will a clean energy project impact the price of energy in the community?

No. It is unlikely that any single renewable energy project would serve to lower the price of energy in the immediate term, as these rates are set by the Utility based on territory-wide operations costs, including fuel prices. However, what QEC can say for certain, is that renewable energy will not cause rates to go up. Info about QEC's IPP Policy can be found here: <https://www.qec.nu.ca/customer-care/generating-power/independent-power-producer-program>

Environmental Impact Questions

What environmental impacts could the project have?

Solar energy projects typically have low environmental impacts. Prior to any project being approved, an Environmental Impact Assessment must be completed to ensure potential impacts are minimized. In Nunavut, projects are assessed through the territorial assessment body, the Nunavut Impact Review Board (NIRB), and through the Nunavut Planning Commission (NPC), which ensures that new projects conform to land use plans.

Solar projects do require space, which can displace existing use of the land by wildlife or humans. Selection of land is therefore carefully considered to minimize impacts to wildlife habitat and land users. As with similar infrastructure projects, land disturbance during construction cannot be avoided, and remediation will be completed where needed to return land to its pre-disturbed state.

Solar energy projects also have positive environmental impacts because they displace the use of fossil fuels, which results in less environmental impacts from fuel spills and reduced air pollution.

Will the project impact traditional land use activities like hunting?

Candidate sites were carefully screened in collaboration with local knowledge holders to minimize the impact on traditional land use as much as possible. More specifically, the project team has consulted with the Hunters and Trappers Organizations in Nauyasut to ensure traditional land use will not be adversely impacted.

Technology and Operations Questions

How does solar energy work?

Solar energy technologies capture light energy from the sun and convert it to electricity using solar photovoltaics (solar PVs). Solar PVs consist of thin membranes made from special metals called semiconductors (e.g. silicon), mounted on self-contained glass panels. When these membranes absorb light, the light energizes electrons within to create an electrical current. Electricity from solar panels is produced in direct current (DC) but has to be converted to alternating current (AC), which is the type of energy used in our homes. Inverters collect electricity from the solar panels and convert it from DC into AC before transmitting it to the grid.

How long do solar energy projects last?

Solar energy projects have an average lifespan of **30+ years**. Solar panels themselves have no moving parts and very long lifespans, however, decreases in the efficiency of supporting equipment such as inverters and batteries dictate the operable lifespan of a solar project. This equipment is usually replaced at least once during a project's lifetime.

What kind of maintenance work is required to keep a solar project operating?

Solar facilities typically have no moving parts and need less maintenance, but still require regular inspections by maintenance personnel with electrical knowledge, and may need to be cleared of snow and ice in shoulder seasons.

Is solar energy a proven and reliable technology, even in cold climates?

Yes. In fact, solar PV panels perform better in cold temperatures as long as the panels are free of snow. Other equipment, such as inverters and batteries, must be rated for colder temperatures or can be heated or insulated during the coldest months of the year.

Once projects like these reach the end of their lifespan, what does the removal and disposal process look like? For example, do they go to a municipal landfill?

Once a renewable energy project reaches end-of-life, it may either be re-powered or decommissioned. Decommissioning involves disconnecting the project from the electrical grid, removing all associated structures

and equipment, and returning the land to its previously undisturbed state. In both cases, removal and recycling of a portion, if not all, of the project are required.

Most of the components of a solar installation can be removed and recycled without the use of heavy equipment. Metal from the framing, inverters, wiring and battery housing can be salvaged and recycled as scrap metal. The panels themselves are often sold or donated to other buyers who wish to refurbish and reuse them. The recycling industry for solar panels is currently small and contained in the US, but growing. In 30 years' time, recycling is projected to be more widely available, and panels could be shipped to the nearest recycling facility.

What is the role of a battery in renewable energy projects? Can they be reused?

Large, utility-scale batteries play an important role in micro-grid renewable energy projects by storing excess energy (charging) when energy production is high and releasing stored energy (discharging) when energy production is low. Renewable energy can be intermittent (e.g. the sun may go behind a cloud, or the wind can suddenly stop blowing), so this reservoir of energy storage helps to protect small, isolated grids from sudden drops or surges in power.

Battery energy storage systems are designed to be reused many thousands of times before they must be replaced. However, over time, batteries experience a decrease in their efficiency and energy storage capacity. Depending on usage and wear and tear, large battery systems typically must be replaced every 15 years.

Regional and Small-Scale Solar Energy Questions

Why doesn't Nunavut have solar panels in every community?

The cost of solar panels is coming down globally, but they still require a significant upfront investment to install, even at smaller scales. Larger solar energy projects are complex undertakings that require extensive planning, a large capital investment, and coordinated delivery of many parts and personnel. These projects, therefore, take time to build and pay for, which often means adoption can be slow.

QEC has several programs to enable the installation of small-scale rooftop solar, such as their Net Metering Program. This program allows owners of rooftop solar to receive an energy credit for any surplus power they produce and sell back to the grid. Info about the Net Metering Program can be found here:

<https://www.qec.nu.ca/node/759>

What about small-scale solar panels for cabins?

Small-scale solar installations on rooftops can be a great source of renewable energy during the summertime. In more remote areas, such as on cabins, solar can be a great way to supplement power for an off-grid house during the summer, but supplementary power is needed in the winter time when it is dark most of the day. The Climate Change Secretariat launched the Renewable Energy Cabin Grant in November 2021, which allows cabin owners to apply for up to \$5000 towards a solar or wind system on their cabin. Information about this program can be found here: <https://climatechangenunavut.ca/en/renewable-energy-cabin-grant-program-guide>

Are there other solar energy projects in Nunavut, or across the rest of the Arctic?

Solar projects are more prevalent in Nunavut than wind projects, and there are a number of smaller-scale residential rooftop solar installations. However, no utility-scale solar energy projects are operational in Nunavut yet, with the exception of a demonstration project by QEC in Iqaluit. Utility-scale solar energy projects have been successfully deployed in other northern regions, including the Old Crow Solar Farm in the Yukon (<https://www.cbc.ca/news/canada/north/old-crow-solar-farm-changing-green-energy-projects-yukon-1.6434746>), and several solar projects in Alaska (<https://www.akenergyauthority.org/What-We-Do/Renewable-Energy-and-Energy-Efficiency-Programs/Solar/Alaska-Solar-Projects>).